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HOLDING EPA ACCOUNTABLE FOR POLLUTING WESTERN WATERS

HEARING

BEFORE THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

September 9, 2015

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HOLDING EPA ACCOUNTABLE FOR POLLUTING WESTERN WATERS

WEDNESDAY, SEPTEMBER 9, 2015

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Committee met, pursuant to call, at 10:05 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Lamar Smith [Chairman of the Committee] presiding.

LAMAR S. SMITH, Texas
CHAIRMAN

EDDIE BERNICE JOHNSON, Texas
RANKING MEMBER

Congress of the United States
House of Representatives
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Full Committee

Holding EPA Accountable for Polluting Western Waters

Wednesday, September 9, 2015
10:00 a.m. – 21:00 a.m.
2318 Rayburn House Office Building

Witnesses

The Honorable Mathy Stanislaus, Assistant Administrator, Office of Solid Waste and Emergency Response, Environmental Protection Agency

Mr. Dennis Greaney, President, Environmental Restoration LLC

The Honorable Donald Benn, Executive Director, Navajo Nation Environmental Protection Agency

The Honorable Dean Brookie, Mayor, Durango, Colorado

Dr. Mark Williamson, Geochemist, Geochemical Solutions LLC

U.S. House of Representatives
Committee on Science, Space, and Technology

HEARING CHARTER

Holding EPA Accountable for Polluting Western Waters

Wednesday, September 9, 2015
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

Purpose

On September 9, 2015, the Committee on Science, Space, and Technology will hold a hearing titled *Holding EPA Accountable for Polluting Western Waters*. The hearing will examine circumstances surrounding the 3 million gallon toxic waste spill at the Gold King Mine in Colorado that was apparently caused by a contractor acting at the direction of the Environmental Protection Agency (EPA). The hearing will also address EPA's response to the incident and the long-term impacts of the spill on health, the environment, and local economy.

Witnesses

- **The Honorable Mathy Stanislaus**, Assistant Administrator, Office of Solid Waste and Emergency Response, Environmental Protection Agency
- **Mr. Dennis Greaney**, President, Environmental Restoration LLC
- **The Honorable Donald Benn**, Executive Director, Navajo National Environmental Protection Agency
- **The Honorable Dean Brookie,** Mayor, Durango, Colorado
- **Dr. Mark Williamson,** Geochemist, Geochemical Solutions LLC

Background

On August 5, 2015, a team of contractors from Environmental Resources, LLC (ER), acting at the direction of the Environmental Protection Agency (EPA), "accidently caused" contaminated water from the Gold King Mine near Durango, Colorado to flow into the Animas River.[1] While removing debris from a collapsed/covered adit (opening) a small leak appeared that eventually turned into a large opening.[2] The spill "sent a yellow plume south into the Animas River and turned Western waterways into a mustard ribbon, causing three states and the Navajo Nation to declare states of emergency."[3]

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[1] Eli Watkins, *EPA Crew Accidently Turns Animas River Orange*, CNN, Aug. 8, 2015, *available at* http://www.cnn.com/2015/08/07/us/colorado-epa-mine-river-spill-irpt/.
[2] Mariana Castillo, *Pollution Flowing Faster Than Facts in EPA Spill*, CNN, Aug. 10, 2015, *available at* http://www.cnn.com/2015/08/10/us/colorado-epa-mine-river-spill/.
[3] *See* Julie Turkewitz, *Colorado Spill Heightens Debate Over Future of Old Mines*, The New York TIMES, Aug. 16, 2015, *available at* http://www.nytimes.com/2015/08/17/us/animas-river-colorado-mine-spill-epa.html.

The toxic spill was so substantial that it traveled nearly 300 miles through Colorado, New Mexico and Utah, to Lake Powell on the Arizona-Utah border.[4] The wastewater contained lead, arsenic, thallium and other heavy metals that may cause health problems and harm aquatic life.[5] At one point, the lead level in the Animas River was nearly 12,000 times higher than the acceptable standard set by EPA.[6] Moreover, "[p]ublic drinking water systems were temporarily shut down and farmers from the Navajo Nation stopped using river water for irrigation."[7] Many local businesses that rely on the river were reportedly forced to shut down for several days after the accident.[8]

Many questions have been raised about the timeliness of EPA's communications with state and local officials immediately following the spill.[9] In some instances, the appropriate authorities were not notified of the spill until 24 hours after the incident.[10] EPA was also slow to provide the public with information about the accident. For example, EPA initially admitted to only spilling 1 million gallons of waste from the mine, but the severity of the spill was later changed to 3 million gallons, three times the amount initially disclosed.[11]

More troubling, EPA officials apparently knew the potential for a blowout of toxic wastewater from the mine more than a year before the spill occurred.[12] Only after facing increased public scrutiny, EPA finally released documents regarding concerns about a blowout of toxic wastewater from the Gold King Mine.[13] One of the documents, an EPA task order from June 2014, showed that a blowout could cause the release of large volumes of contaminated mine waters.[14] The EPA task order also called for the construction of a holding pond to capture water so contaminants could be removed by settling out or treatment, but the pond was not completed before the spill.[15] Further, EPA's response plan for an accidental spill lacks many necessary details.[16]

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[4] Matthew Brown, *New Documents Raise More Questions About Colorado Mine Spill*, ASSOCIATED PRESS, Aug. 24, 2015, *available at* http://abcnews.go.com/US/wireStory/documents-raise-questions-colorado-mine-spill-33290547 .
[5] *EPA Knew of 'Blowout' Risk for Tainted Water at Gold Mine*, ASSOCIATED PRESS, Aug. 22, 2015, *available at* http://www.nytimes.com/aponline/2015/08/22/us/politics/ap-us-mine-waste-leak.html; *see also Supra*, note 5.
[6] Elizabeth Cohen, Health Impact of Animas River Toxic Spill: 'This is a Real Mess', CNN, Aug. 11, 2015, *available at* http://www.cnn.com/2015/08/10/us/animas-river-toxic-spill-colorado .
[7] Brown, *supra* note 4.
[8] *See* Julie Turkwitz, *Environmental Agency Uncorks Its Own Toxic Water Spill at Colorado Mine*, THE NEW YORK TIMES, Aug. 10, 2015, *available at* http://www.nytimes.com/2015/08/11/us/durango-colorado-mine-spill-environmental-protection-agency.html; *see also Supra* note 3.
[9] *See* Hon. Tom Udall & Hon. Martin Heinrich, et al., U.S. Congress, to Hon. Gina McCarthy, Administrator, EPA, *available at* http://www.tomudall.senate.gov/?p=press_release&id=2067; *see also* Dan Frosch, *Colorado, New Mexico Free Up State Funds for Gold-Mine Spill*, WALL STREET Journal, Aug. 10, 2015, http://www.wsj.com/articles/colorado-pledges-funds-to-help-clean-up-gold-mines-sludge-spill-1439237643.
[10] *See* Mariano Castillo, *Damage to Navajo Nation Water Goes Beyond Money*, CNN, Aug. 13, 2015, *available at* http://www.cnn.com/2015/08/12/us/navajo-nation-water-epa-spill/.
[11] Steve Garrison & Joshua Kellogg, *EPA: Pollution from Mine Spill Much Worse Than Feared*, USA TODAY, Aug. 10, 2015, *available at* http://www.usatoday.com/story/news/nation/2015/08/09/navajo-nation-epa-spill/31384515/.
[12] Assoc. Press, *supra* note 5.
[13] *Id.*
[14] Brown, *supra* note 4.
[15] *Id.*
[16] *Id.*

On August 10, 2015, the Committee wrote EPA requesting documents and information about the toxic spill by August 24.[17] While the agency did not provide any documents or information directly to the Committee by the deadline, EPA began posting selected information to a public website. The Committee again wrote to EPA on August 27, requesting among other things, unredacted documents and video footage of the incident.[18] In response to the Committee's second letter, EPA provided the Committee with a portion of the requested materials on September 3.

To date, the EPA has reportedly spent nearly $4 million on the response to the spill.[19]

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[17] Letter from Hon. Lamar Smith, Chairman, House Committee on Science, Space, and Technology, to Hon. Gina McCarthy, Administrator, EPA (Aug. 10, 2015), *available at* http://science.house.gov/sites/republicans.science.house.gov/files/documents/8-10-15%20CLS%20to%20McCarthy%20re%20Gold%20King%20Mine.pdf.

[18] Letter from Hon. Lamar Smith, Chairman, House Committee on Science, Space, and Technology, to Hon. Gina McCarthy, Administrator, EPA (Aug. 27, 2015).

[19] *See* Jesse Paul, *Gold King Mine: EPA Was Told of Blowout Danger in June 2014*, Aug. 22, 2015, *available at* http://www.denverpost.com/news/ci_28685398/gold-king-mine-epa-was-told-danger-blowout.

Chairman SMITH. The Committee on Science, Space, and Technology will come to order.

Without objection, the Chair is authorized to declare recesses of the Committee at any time.

And welcome to today's hearing titled "Holding EPA Accountable for Polluting Western Waters." I'll recognize myself for an opening statement and then the Ranking Member.

Over the last year, the Environmental Protection Agency has proposed some of the most expensive and burdensome regulations in its history. These rules will cost American families billions of dollars, all for little impact on climate change. These rules also will diminish the competitiveness of American workers around the world.

The same government agency that has proposed these rules recently caused an environmental disaster that has adversely impacted three states in the Mountain West. On August 5th, near Silverton, Colorado, the negligent actions of the EPA caused over three million gallons of toxic water to cascade out of a mine that had been closed for almost a hundred years. This event turned the Animas River orange and polluted a 300-mile stretch of water.

Today, we will examine how this disaster, which negatively affected thousands of people, occurred and why the warning signs that should have prevented it from happening were negligently dismissed. Had the EPA exercised the same care in making their decisions as an ordinary, prudent person, this whole incident could have been avoided.

The EPA should be held accountable. The same standards that the EPA applies to private companies should also apply to the EPA itself. Unfortunately, EPA Administrator Gina McCarthy has declined to appear before this Committee and answer questions about the role her Agency played in causing this preventable spill. Perhaps she doesn't have any good answers. Given the EPA's consistent failure to provide information to this Committee and the American people, the EPA can be assured that our oversight efforts will continue.

The public deserves to know why the EPA continues to spend so much of their hard-earned dollars on costly and ineffective regulations, especially when the agency has been unable to achieve its core mission of protecting the environment. The story of the mine disaster would be much different if this spill had been caused by a private company. I suspect there would be calls from this Administration and others for the executives of the company to resign. There would be demands that all documents be posted immediately online. Massive fines would be imposed. And, no doubt, some individuals might be prosecuted as happened in the 2014 West Virginia chemical spill where 7,500 gallons of chemicals were dumped into the Elk River. This is about one four hundredth of the amount of toxic water dumped into the Animas River. Six former officials from the company responsible for the leak were indicted for violations of the Clean Water Act.

The EPA's negligence is especially inexcusable since there were known procedures that could have prevented the river's pollution. Unfortunately, we have seen a pattern of the EPA's lack of transparency. This Committee asked for information from the EPA al-

most a month ago and we have yet to receive all the documents that were requested. According to news reports, it took the EPA over 24 hours to inform the public about the seriousness of the spill and their initial claim of one million gallons of toxic waste was later revised when it was learned that it was actually three million gallons. Then, after the incident, all we heard from the EPA was that the toxic water in the river was dissipating, and that the river was returning to pre-spill levels. The EPA neither took responsibility nor were they forthright with the American people. So it's not surprising to learn that just this past spring the EPA received a grade of D for its lack of openness and transparency, according to the nonpartisan Center for Effective Government. It is my hope that the EPA will finally come clean with the American people about their involvement in this tragic incident.

[The prepared statement of Chairman Smith follows:]

PREPARED STATEMENT OF COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
CHAIRMAN LAMAR S. SMITH

Over the last year, the Environmental Protection Agency (EPA) has proposed some of the most expensive and burdensome regulations in its history.

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Unfortunately, we have seen a pattern of the EPA's lack of transparency. This Committee asked for information from the EPA almost a month ago and we have yet to receive all the documents that were requested.

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toxic waste was later revised when it was learned that it was actually three million gallons.

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So it's not surprising to learn that just this past spring the EPA received a grade of "D" for its lack of openness and transparency, according to the non-partisan Center for Effective Government.

It is my hope that the EPA will finally come clean with the American people about their involvement in this terrible incident.

Chairman SMITH. That concludes my opening statement, and the Ranking Member, the gentlewoman from Texas, Ms. Eddie Bernice Johnson, is recognized for hers.

Ms. JOHNSON OF TEXAS. Thank you very much, Mr. Chairman. I appreciate the fact we are holding this hearing today.

The August 5th release of three million gallons of wastewater from the Gold King Mine in Silverton, Colorado, into the Animas River was an unfortunate accident. I believe it is important to understand what happened on August 5th and why, and explore what lessons we can learn from this event. However, we should also take this opportunity to highlight the inherently dirty, dangerous, and environmentally damaging process of metal mining.

Before this accident occurred, Gold King and a handful of other mines in the area were releasing more than 300 million gallons of acid mine waste into the Animas Watershed annually. Over the area's 120-year history of mining operations, more than 17.2 billion pounds of mining and milling byproducts containing toxic chemicals were released into this waterway. Unfortunately, residents of San Juan County are well aware that August 5th was not the first time the Animas River changed color. In the 1970s, mine accidents poured millions of gallons of wastewater into the river. Sadly, acid mine drainage in this area is routine and the occasional large scale release of wastewater due to accidents at mine sites is an all-too-common occurrence.

I'd like to show a photo that ran in The Durango Herald newspaper in 2012 that shows toxic wastewater flowing from the American Tunnel three years before the recent accident at the Gold King Mine. The second picture was taken before the Red and Bonita Mine, and the wastewater is draining into the Cement Creek, a tributary that feeds into the Animas River. This photograph was taken in 2013.

This was one of the key reasons the EPA was at the Gold King Mine site on August 5th. They were there attempting to investigate this longstanding problem of persistent acid mine drainage into the Animas Watershed from the Gold King and neighboring interconnected mines. EPA was also attempting to alleviate what was seen as an inevitable blowout at the Gold King mine due to a build-up of drainage water that may have been caused by the closure of the American Tunnel, a mine drainage system, at the nearby Sunnyside Mine. Unfortunately, they were obviously unsuccessful in trying to prevent a blowout from occurring.

These next two photos show the discoloration of the Animas River immediately after the August 5th accident, and the next two photos show what the Animas River looked like August 12th and August 14th, 7 and 9 days after the Gold Mine accident.

Fortunately, the metal concentrations in the water that led to the discoloration of the Animas River quickly returned to pre-incident levels. I am not discounting the significance of the August 5th event at the Gold King Mine but its potentially environment impact—or its potential environmental impact, but it is important to understand that the issue of mine drainage into the Animas Watershed did not begin last month.

The EPA was acting as an environmental firefighter when they went to the Gold King Mine. They were attempting to damp down a raging environmental hazard that had endangered the Animas Watershed for decades. Unfortunately, when they opened an exploratory hole, the buildup of wastewater drainage was too much to effectively control.

I hope that our witnesses, particularly Mayor Dean Brookie, the Mayor of Durango, Colorado, located 50 miles downstream from the Gold King and hundreds of other inactive mine sites, can help address both the events leading up to the August 5th blowout at the Gold King mine, the legacy of metal mining operations on the Animas Watershed, and useful next steps to consider in helping to prevent further environmental degradation in this truly beautiful region of our nation.

Thank you Mr. Chairman. I yield back.

[The prepared statement of Ms. Johnson of Texas follows:]

PREPARED STATEMENT OF COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
RANKING MEMBER EDDIE BERNICE JOHNSON

Good morning and thank you, Mr. Chairman. I would also like to thank our distinguished panel of witnesses for their testimony on this important and timely issue.

I want to echo the comments of Ranking Members Beyer and Grayson regarding the need for a critical examination of our country's electric grid. Today's grid is the foundation of our economy and much of our infrastructure, and millions of American homes, businesses, and livelihoods depend on its reliability.

Investing in new, diverse energy sources is an important part of securing our clean energy future, but these investments are put at risk if we don't immediately address vulnerabilities to the grid, as well as form a plan in the event of a large-scale grid failure.

Given our current state of preparedness, a coordinated cybersecurity or terrorist attack, or a major natural disturbance of the type we'll be hearing more about today, could leave a large portion of the United States dark for months and result in billions of dollars in economic damages. But what may be even more concerning is that it would not take such a disastrous phenomenon to render our energy infrastructure useless. Aging infrastructure presents a much more likely and just as problematic vulnerability as the more eye-catching disasters that are often mentioned as being serious threats to the grid. With no current means to quickly recover from a high magnitude power outage, we are putting the future of our country in jeopardy if we continue to ignore systemic vulnerabilities.

This issue should not be taken lightly. We have seen the massive impacts that seemingly minor, preventable incidents can have on communities, such as the Northeast Blackout of 2003 that crippled a large regional area and brought their economies to a halt for days. This led to the loss of power for 50 million people.

While this was one of the worst outages in our history, the grid is still plagued with numerous vulnerabilities over 12 years later. Intelligence professionals, scientists, and industry experts have all been urging the federal government to strengthen the nation's power supply for years now. And for those who worry about the cost of doing so, the U.S. Federal Energy Regulatory Commission estimates that protecting the grid would cost the average rate payer merely 20 cents annually.

I am optimistic that this hearing will help to advance the progress that partnerships between governments and utilities have made so far in bolstering the grid against today's unique security challenges. I look forward to a productive and interesting discussion. With that, I yield back.

Chairman SMITH. Thank you, Mrs. Johnson, and I'll proceed to introduce our witnesses. Our first witness is the Honorable Mathy Stanislaus, the Assistant Administrator for the EPA's Office of Solid Waste and Emergency Response. Mr. Stanislaus was nominated and confirmed by the U.S. Senate for his current position at the EPA in 2009. He received his law degree from Chicago Kent Law School and a chemical engineering degree from City College of New York.

Our next witness is Mr. Dennis Greaney, Managing Partner and President of Environmental Restoration LLC. He received his bachelor's of science in ecology from the University of Illinois, Urbana Champaign campus, and did graduate work in environmental toxicology at Illinois State University.

Our next witness is Dr. Donald Benn, the Executive Director of the Navajo Nation's Environmental Protection Agency. Dr. Benn received his Ph.D. in chemistry from New Mexico State University.

Our next witness is the Hon. Dean Brookie, the Mayor of Durango, Colorado. He received his bachelor's of environmental design and master's of architecture from the University of Colorado at Boulder.

Our last witness is Dr. Mark Williamson, an Environmental Geochemist with over 25 years of experience. He has been involved in geochemical studies and site evaluations across the United States involving field, laboratory and computational components. Dr. Williamson's background includes extensive work with acid mine drainage, metals in aquatic environments, geochemical engineering, and the fate and transport of chemicals in the environment. He holds a Ph.D. from Virginia Tech, a master's degree from Northern Arizona University, and a bachelor's degree from Old Dominion University.

Now, we welcome you all and look forward to your testimony, and Mr. Stanislaus, will you start us off?

TESTIMONY OF THE HON. MATHY STANISLAUS, ASSISTANT ADMINISTRATOR, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, ENVIRONMENTAL PROTECTION AGENCY

Hon. STANISLAUS. Good morning Chairman Smith, Ranking Member Johnson, and Members of the Committee. I am Mathy Stanislaus, Assistant Administrator for the U.S. Environmental Protection Agency's Office of Solid Waste and Emergency Response that is responsible for the EPA cleanup and emergency response program. Thank you for the opportunity to appear today to discuss the Gold King Mine release and subsequent EPA response.

Located within the watershed of the San Juan Mountains in southwestern Colorado are some 400 former mines, which were the focus of both large- and small-scale mining operations for over 100 years. The Gold King Mine is located in the upper Animas Watershed, which consists of three main streams: the Animas River, Cement Creek, and Mineral Creek. These mines have had a history of water siege containing heavy metals and instability.

In 1991, mining ceased at the last big mine in the region, Sunnyside. Subsequently, based on a permit issued by the State of Colorado, Sunnyside installed three bulkheads in the American Tunnel

that drained its mine while continuing to treat the metal-laden waters draining into Upper Cement Creek through a water treatment facility. After Sunnyside installed the bulkheads in the American Tunnel, water seeped into natural fractures that allowed it to flow into the Gold King and Red and Bonita Mines.

Initially, these waters are run through a treatment system that Sunnyside built but Gold King Mine Company ultimately stopped operating the treatment system. In 2008, the State of Colorado continued its effort by constructing a water discharge diversion system and reclamation plant to address the potential for increased water pressure within Gold King Mine. Based upon data from 2009 to 2014, flow data, the average annual water discharge from Gold King Mine and three nearby mines reach approximately 330 million gallons per year.

At the request of local stakeholders for EPA involvement, by 2014 EPA joined the Colorado Division of Reclamation Mining and Safety to address both the potential for water buildup at the Gold King Mine and ongoing adverse water quality impacts caused by these large mine discharges into the Upper Animas Watershed. Working with the State of Colorado and the Animas River Stakeholders Group, EPA developed plans to reduce potential mine water pressure and reduce mine discharges into Cement Creek and downstream waters.

In 2014, initial work was performed at the Gold King Mine to relieve some water buildup. On August 5th, 2015, EPA was conducting an investigation of the Gold King Mine. Work was underway to dewater the mine pool to allow reopening to assess mine conditions to characterize ongoing mine discharges and determine appropriate mine mitigation measures. While excavating above a mine opening, the lower portion of bedrock crumbled and pressurized water of approximately three million gallons of water stored behind the collapsed material discharged into Cement Creek, a tributary of the Animas River.

EPA and Colorado officials informed downstream jurisdictions within Colorado the day of the event and before the plume reached drinking water intakes and irrigation diversions. The following day, other downstream jurisdictions were notified again before the plume reached drinking water intakes and irrigation diversions. The notification warned downstream users so that drinking water intakes and agricultural intakes were able to be closed prior to downstream plume release reaching those intakes.

However, broader notification should have occurred. I've issued a guidance memo to all ten regions to work with state, tribal and local partners to enhance our joint incident notification responsibility and processes. I understand the State of Colorado is moving forward in the same vein.

On August 26, 2015, EPA released its internal review summary review, which includes an assessment of the events and potential factors contributing to the Gold King Mine incident. The internal review team found that the work went accounted for the possibility of pressurized mine water conditions due to the history of blockages of the Gold King Mine and the work plan identified steps to gradually lower the blockage and water buildup. The review team found that experienced professionals from the EPA and the

State of Colorado concluded there was likely no or low mine water pressure. However, given the release that was in fact high enough water pressure to cause a blowout, the summary report concludes that an underestimation of water pressure inside the mine working was likely the more significant fact related to the release. The report indicates the site conditions made it difficult to undertake drilling to determine the pressure within the mine.

I do have a lot more to talk about, but I'll take your questions and respond to those.

[The prepared statement of Hon. Stanislaus follows:]

TESTIMONY OF
MATHY STANISLAUS
ASSISTANT ADMINISTRATOR
OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SCIENCE, SPACE, AND TECHNOLOGY COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

September 9, 2015

Good morning Chairman Smith, Ranking Member Johnson, and Members of the Committee. I am Mathy Stanislaus, Assistant Administrator for the U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response (OSWER) that is responsible for the EPA cleanup and emergency response program. Thank you for the opportunity to appear today to discuss the Gold King Mine release and subsequent EPA response.

As EPA Administrator McCarthy has said, this was a tragic and unfortunate incident, and the EPA has taken responsibility to ensure that it is cleaned up appropriately. The EPA's core mission is to ensure a clean environment and protect public health, and we are dedicated to continuing to do our job to protect the environment and to hold ourselves to the same high standard we demand from others. The EPA is committed to working closely with response agencies and state, local and tribal officials to ensure the safety of citizens, respond to concerns, and to evaluate impacts to the environment.

Background

There are an estimated 23,000 former mines located in the state of Colorado. Of these mines, 6,127 have been addressed by the Colorado Division of Reclamation, Mining and Safety (DRMS). To help address the legacy of hardrock mining across the country, the Administration

has proposed in the FY 2016 and prior budgets to create an Abandoned Mines Lands (AML) Program for hardrock mines. The program would be funded through a new AML fee which would hold the hardrock mining industry responsible for the remediation of abandoned hardrock mines, just as the coal mining industry pays to reclaim abandoned coal mines.

Located within watersheds of the San Juan Mountains in southwestern Colorado are some 400 abandoned and inactive mines which have been the focus of both large and small scale mining operations between 1871 and 1991. The Gold King Mine is located in the Upper Animas Watershed which consists of three main streams, the Animas River, Cement Creek and Mineral Creek all of which drain the Silverton Caldera. The Animas River and many of its tributaries have historically received high concentrations of heavy metals from both acid rock/mine drainage at mine sites and from naturally occurring metal loading sources not affected by mining.

Water draining from these mines occurs when mining operations in the mountainsides alter the hydrology of the area and combine with natural springs, pulling water into mine tunnels. The water reacts with iron disulfide (pyrite) and oxygen to form sulfuric acid (acid rock/mine drainage). The resulting acidic water dissolves naturally occurring heavy metals such as zinc, lead, cadmium, copper and aluminum and results in water containing these metals flowing out of the mine adits (openings used for access or drainage).

When mining operations in the Upper Animas Watershed ceased, many of the mines were left discharging contaminated water into streams and rivers. In 1991, the last big mine in the region, the Sunnyside, stopped mining. Its owner, Sunnyside Gold Corp., proposed to install 3 bulkheads (mine plug) in the American Tunnel that drained its mine and the Colorado Mined Land

Reclamation Board approved a permit to allow the plugging. In 1996, Sunnyside reached a settlement agreement with the Colorado Water Quality Control Division to clean up abandoned mines nearby, while continuing to treat the metal-laden waters draining into upper Cement Creek through a water treatment facility. In 2002, Sunnyside and the Water Quality Control Division agreed to amend the settlement agreement to allow Sunnyside to turn over its water treatment operations to Gold King Mining Corporation. After Sunnyside installed the bulkheads in the American Tunnel, water flow out of the Gold King and Red and Bonita Mines increased substantially. Initially, the water from these mines, Upper Cement Creek, and the American Tunnel were run through the treatment plant that Sunnyside built, but after Gold King experienced a number of technical and financial issues, the treatment plant stopped operating in mid-2004.

The Colorado DRMS took action to address mine drainage into water resources in the Upper Animas by issuing a permit in 1986 for work on the Gold King mine adits. In 2008, the state continued its effort by constructing a discharge diversion structure (flume channel) to prevent additional water from pooling behind Gold King adit blockages and by developing a Gold King Mine Reclamation Plan in 2009 to address increased water pressure within the Gold King workings. Based upon 2009 – 2014 flow data, the average annual water discharge from the Gold King Mine and three nearby mines (Mogul, Red and Bonita, and American Tunnel) reached approximately 330 million gallons per year. By 2014, the EPA was working with the state of Colorado to take action at the Gold King Mine to address both the potential for a catastrophic release and the ongoing adverse water quality impacts caused by the significant mine discharges into the Upper Animas Watershed. Working with DRMS and the Animas River Stakeholder Group, the EPA planned to take action to reduce potential mine pool water pressure and reduce

increased mine discharges into Cement Creek and downstream waters by addressing the Gold King Mine adit blockages.

Regarding prior Superfund program activity, the EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted a Superfund Site Assessment of the area in the 1990s. The assessment showed that water quality standards were not achieved in the Animas River near Silverton and identified the severe impacts to aquatic life in the Upper Animas and its tributaries from naturally occurring and mining-related heavy metals. In recognition of a community-based collaborative effort, the EPA agreed to postpone adding all or a portion of the site to the Superfund National Priorities List (NPL), as long as progress was being made to improve the water quality of the Animas River.

Until approximately 2005, water quality in the Animas River was improving. However, since the water treatment plant ceased operations, water quality in the Animas River has not improved, and for at least 20 miles below the confluence with Cement Creek, the water quality has declined significantly. Impacts to aquatic life were also demonstrated by fish population surveys conducted by Colorado Parks and Wildlife, which found no fish in the Animas River below Cement Creek for approximately two miles and observed precipitous declines in fish populations as far as 20 miles downstream since 2005.

Because of this declining water quality in the Animas River, in 2008, EPA's Superfund Site Assessment program, working with the state of Colorado, began investigations in Upper Cement Creek focused on evaluating whether the Upper Cement Creek area alone would qualify for inclusion on the NPL. This evaluation indicated that the area would likely qualify, although after receiving additional community input, the EPA deferred efforts to include the area on the NPL.

Since that time, the EPA, working with the state of Colorado, has continued and broadened its investigations of conditions at the site in order to understand the major sources of heavy metal contamination in the Upper Animas Watershed.

EPA Activities and Response at Gold King Mine

On August 5, 2015, the EPA was conducting an investigation of the Gold King Mine near Silverton, Colorado. Work was underway to dewater the mine pool to allow reopening of an adit to assess mine conditions to characterize ongoing mine discharges and determine appropriate mine mitigation measures. While excavating above an old adit, or mine opening, the lower portion of the bedrock crumbled and pressurized water began leaking above the mine tunnel. The leak quickly turned into a breach releasing approximately three million gallons of water stored behind the collapsed material into Cement Creek, a tributary of the Animas River. EPA and Colorado officials informed downstream jurisdictions within Colorado the day of the event and before the plume reached drinking water intakes and irrigation diversions. The following day, other downstream jurisdictions were notified, again, before the plume reached drinking water intakes and irrigation diversions.

The EPA deployed federal On-Scene Coordinators and other technical staff within 24 hours to Silverton and Durango Colorado, Farmington, New Mexico and the Navajo Nation to assist with preparations and first response activities in these jurisdictions. The agency continues to share information as quickly as possible with the states, tribes, and local communities as experts continue to work to analyze the impact of the release from the mine.

The agency activated its Emergency Operations Center in Washington D.C. and established a Unified Command Center in Durango, Colorado to help ensure coordination among its regions, laboratories and national program offices. The EPA has closely coordinated with our federal partners and with officials in Colorado, New Mexico, Utah, the Southern Ute and Ute Mountain Ute tribes and the Navajo Nation. The EPA response actions helped contain the leak, and flow from the mine is now controlled and being treated in a series of treatment ponds. Following the August 5 release, EPA and Colorado field staff and officials, notified state, local, and tribal officials prior to the contaminated plume reaching downstream water system intakes and irrigation water intakes.

One of the initial lessons learned in the aftermath of the Gold King Mine release is that the EPA can improve its communications regarding releases and other environmental events that may affect multiple jurisdictions. To support response related notifications and communications between the EPA and our state, tribal and local partners, I have issued guidance to Regional Response Teams (RRTs) to strengthen their Regional Contingency Plans, particularly regarding the need to alert and coordinate with responders in downstream alerts. I will ask RRTs to conduct an exercise that tests these strengthened alert mechanisms. I am also providing guidance to the Emergency Operations Center in EPA Headquarters and the ten Regional Operations Centers to improve information sharing with one another so that they can coordinate alerts as needed to downstream communities. Although this effort may result in some level of redundancy with existing state, tribal, and local notification mechanisms, we believe that receiving multiple notices is preferable to receiving late notification.

Following the August 5 release, the EPA opened a Unified Command Center in Durango, Colorado and an Incident Command in Farmington, New Mexico. At the height of the response, EPA employee and contractor supported exceeded 200 personnel. There are more than 20 different federal, state, and local agencies involved in the response working to help ensure the health and safety of the public.

As part of the response efforts, water quality samples were collected throughout the water system from multiple locations in Colorado and New Mexico to the Navajo Nation at daily intervals beginning on August 6, 2015[1]. Sediment sampling began on August 11, 2015. Surface water samples taken prior to the plume's arrival were used to establish a baseline for water quality comparisons. Each surface water sample was analyzed for 24 metals, including arsenic, cadmium, lead and mercury. Surface water samples were collected on August 6, 2015, at two (2) locations prior to arrival of the plume along the Animas and San Juan Rivers in New Mexico.

As of September 6, 2015, the EPA has collected 961 surface water samples and 689 sediment samples. The EPA has also tested private domestic drinking water wells from along the rivers in both Colorado and New Mexico, and as of September 6, the EPA has collected a total of 651 private drinking water well samples. Drinking water well data is being provided directly to the well owner.

The EPA has treated mine water in a series of settling ponds constructed near the portal. The treatment has been effective, and we are reducing the acidity of the water with the addition of lime and sodium hydroxide solution to facilitate sedimentation of the metals in the ponds.

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[1] See: http://www2.epa.gov/goldkingmine/data-gold-king-mine-response

Flocculant agents (used in water treatment processes to improve the sedimentation or filterability of small particles) have been added to increase the amount of sedimentation.

Sampling data taken since the event indicates that metals and other constituents in water resources and sediment are returning to pre-event conditions. Based upon the comparison of pre-event data with data collected over the third and fourth weeks of August, the pre-event sampling data show that concentrations for all 24 metals in surface water have trended to pre-event conditions. Based upon the sediment sampling results, sediment sample concentrations are trending toward pre-event conditions as well.

Results consistent with this sampling data set have been utilized by jurisdictions along the Animas and San Juan Rivers to lift water use restrictions for irrigation, livestock watering, and recreational purposes. On August 14, the state of New Mexico lifted restrictions on the use of private water wells and the next day lifted restrictions on San Juan County's drinking water system supplied by the Animas and San Juan Rivers. And on August 14, the city of Durango, Colorado resumed the use of Animas River water for its drinking water system. In addition, sampling data reviewed by the Agency for Toxic Substances and Disease Registry (ATSDR) and the EPA indicate no anticipated adverse health impacts from metals detected in river water. Further, federal, and state fish and wildlife agencies have reported no fish kills or other wildlife impacts along the Animas River. The EPA will continue to work with our federal, state and tribal partners to evaluate potential longer-term ecological impacts in the aftermath of the release.

Specifically for the Navajo Nation, the EPA's conclusions that water and sediment are returning to pre-event conditions are based upon August 24 sampling data results on comparisons of San Juan River water and sediment data to EPA and Navajo EPA standards. Concentrations of iron

and other metals in San Juan River water in the Navajo Nation peaked during the week of August 10 as the mine release moved through the Navajo Nation, but have since trended to pre-release conditions. During the time period of water restrictions, the EPA has provided the Navajo Nation a total of 418,000 gallons of water for livestock and agriculture. The Navajo Nation President Russell Begaye has given the directive to open the Fruitland Irrigation canal, which delivers water from the San Juan River for irrigation to three Navajo chapters.

Agency Inquiry and Public Information Efforts

One of our foremost priorities during the response has been to collect and publicly release information to help ensure the health and safety of affected communities. Numerous status reports, sampling results, and documents have been posted on the agency's Gold King Mine website. The EPA has released documents to the public including the Gold King Mine work plan, the Site Health and Safety Plan, and the EPA Task Order on August 21, 2015. Additional documents were released on August 27 including the contractor's Draft Technical Memo of the August 5 release, including photographs, an EPA On-Scene Coordinator's description of the events depicted in the photographs, and an EPA phone duty officer's memorandum to the file about the incident and certain subsequent events. On August 28, the EPA released documents related to legal agreements, grant funding, contract work, and response summary from a Colorado employee on Gold King Mine. And on August 31, the EPA released documents related to a previous agency package for the Upper Animas Mining District Superfund National Priorities Listing as well as additional photographs of response efforts.

In the aftermath of the Gold King Mine release, the EPA initiated an internal review of the incident. On August 26, 2015, EPA released its Internal Review Summary Report which includes

an assessment of the events and potential factors contributing to the Gold King Mine incident. The Internal Review Team of EPA scientists and engineers conducted a one-week rapid assessment of the Gold King Mine release. To get the facts, the Internal Review Team conducted a site visit, several interviews, and reviewed pertinent documents. Their aim was to quickly assess what occurred and provide conclusions and recommendations so that the agency can learn from this experience and take any necessary actions to address safety at similar sites across the country.

The Internal Review Summary Report lists a number of key findings about the release that occurred on August 5, 2015. The Review Team concluded that the EPA group responsible for excavating the mine collected and analyzed flow data, inspected the site, and became familiar with its topography prior to starting field work. The EPA and the Colorado Division of Reclamation, Mining, and Safety also held public meetings to present their work plans. To the best of the Review Team's knowledge, no informed parties raised concerns about these plans.

The Review Team found that experienced professionals from the EPA and Colorado DRMS concluded that there was likely no or low mine water pressure. This determination was based on several factors, including observing water draining at the site, inspecting for seeps, lower adits at the Red and Bonita Mine were found to be unpressurized, and input from state experts that similar methods had been used at similar mine sites in Colorado. Experts with the state of Colorado supported the investigation and were in the field during the Gold King Mine investigation on August 4 and 5.

However, given the release, there was, in fact, high enough water pressure to cause a blowout. The Summary Report concludes that an underestimation of water pressure inside the mine

workings was likely the most significant factor related to the release. The Report indicates that site conditions made it difficult to undertake drilling to determine pressure within the mine. For example, the slope was steep and unstable, and the underlying bedrock was prone to cave-ins. The Summary Report concludes that such an attempt would have been "very challenging" and suggests that such an attempt may or may not have been successful in ascertaining mine water levels or pressure. Thus, the experts on the ground faced a situation where a difficult "technically challenging", "costly" effort requiring "multiple field seasons to accomplish" could in the end have been unsuccessful and unsafe.

In addition, to further the EPA and public understanding of the events leading up to and including the Gold King Mine release, the EPA announced on August 18 that the U.S. Department of the Interior (DOI) is leading an independent assessment of the factors that led to the Gold King Mine release. This DOI-led review will seek to provide the EPA with an independent analysis of the incident that took place at Gold King Mine, including the contributing causes. The assessment began on August 18, and DOI plans to deliver the assessment report to the EPA and the public before the end of October 2015.

Finally, while inquiries are conducted and response efforts continue, all EPA regional offices were directed to cease field investigation work at a number of other mines, including tailings facilities. While the EPA stops work on existing field investigations and assessments at other mining sites, the EPA also has instructed its regional offices to identify existing sites with similarities to the Gold King Mine site, to identify any potential immediate risks and to consider appropriate response actions.

Conclusion

The EPA is an agency whose core mission is ensuring a clean environment and protecting public health. We will continue working with our state, tribal, and local partners in responding to the tragic and unfortunate release from the Gold King Mine. The EPA is taking responsibility to ensure that it is cleaned up appropriately. We are committed to helping the people throughout the Four Corners Region who rely on the affected rivers for their drinking water, irrigation water and recreation. We know how important it is to them. The EPA is committed to finding out the causes of the release and taking the steps necessary to help ensure that nothing like this release happens again.

Menu

EPA United States Environmental Protection Agency

About EPA

Mathy Stanislaus, Assistant Administrator for the Office of Solid Waste and Emergency Response

Mathy Stanislaus

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- About the Office of Office of Solid Waste and Emergency Response

Mathy Stanislaus

Mathy Stanislaus was nominated by President Barack Obama for the position of Assistant Administrator in EPA's Office of Solid Waste and Emergency Response (OSWER) on March 31, 2009 and began in his service on June 8, 2009 after confirmation by the U.S. Senate.

As Assistant Administrator for OSWER, Mr. Stanislaus leads EPA's programs that revitalizes communities through the cleanup and redevelopment of contaminated sites under Superfund, Brownfields and Resources Conservation and Recovery Act (RCRA) programs, oversees other federal agencies cleanup of contaminated properties, and advances hazardous and solid waste materials management under RCRA, chemical plant safety, oil spill prevention, underground storage tank program, and emergency response. He regularly testifies in Congress regarding aspects of these programs, including rules and budget.

As Assistant Administrator, Mr. Stanislaus has focused on continuing the innovation of the brownfield program to advance the revitalization communities. Recognizing that successful, sustained community revitalization – particularly in communities facing economic distress/disruption – occurs by fostering inclusive revitalization planning among neighborhood stakeholders, local governments and the private sector, he established the innovative Area Wide Brownfields grant program. This tools enables the development of a plan for community-wide improvements such as infrastructure investments to catalyze redevelopment opportunities on brownfield sites to equitably revitalize communities and meet needs for affordable housing, jobs and open space. To align local planning efforts sustainable economic development, he has advanced the prioritization of infrastructure and other economic resources for communities that have established an inclusive area wide plans, such as in the DOT Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant programs. He has advanced the continued alignment of EPA resources with private financing by clarifying brownfield revolving loan fund requirements to accommodate financing structures used in the affordable housing industry. He was recognized Council of Development Finance Agencies for his efforts to align EPA's brownfield resources with local development finance in their 2014 Excellence in Development Finance Award.

He leads EPA's efforts to advance the Obama Administration's Investing in Manufacturing Communities Partnership, a key aspect of the effort to expand middle class job opportunities. He served on the White House Council on Auto Communities and Workers which led the effort to assist local leaders to transition closed auto plants to productive reuses. He is tri-chair of the Obama Administration Chemical Facility Safety and Security Working Group that is leading efforts to assist state and local emergency preparedness organizations, policy changes to improve the safety of chemical plants and other actions set forth in "Executive Order 13650 Actions to Improve Chemical Facility Safety and Security – A Shared Commitment. Report to the President May 2014." He has focused on open government, expanding transparency, and empowering local communities through the Community Engagement Initiative. He leads the Agency's efforts to support community based actions to address environmental justice under Plan EJ 2014. He is leading the effort to transition to a life-cycle based sustainable materials management approach to reduce greenhouse gas emissions and provide materials for manufacturing. He led the finalization of the Definition of Solid Waste rule to advance providing protections for vulnerable communities from the mismanagement of recycling facilities while fostering the increased manufacturing opportunities of recycling of recovered materials. He led the finalization of the first national rule to safely manage coal ash disposal.

He is leading OSWER's actions to advance the President's Climate Action Plan including the implementation of OSWER's adaptation plan. He serves on the interagency working group for the White House Initiative on Asian Americans and Pacific Islanders and leads the work group to advance beauty salon safety. He led EPA's response efforts during the Deep Water Horizon BP Spill in 2010 – serving weeks in Unified Area Command. He served on Department of Interior's Ocean Energy Safety Advisory Committee that was charged to provide critical guidance on improving offshore drilling safety, well containment, and spill response as we explore new energy frontiers.

Mr. Stanislaus is a chemical engineer and environmental lawyer with over 20 years of experience in the environmental field in the private and public sectors. He served as senior environmental counsel at a law firm, and director of environmental compliance for an environmental consulting firm. He started and operated a small business providing consulting services to local governments and local communities on projects ranging from the cleanup and redevelopment of contaminated properties, the proposed siting and expansion of power plants, solid waste facilities and large highways. He has worked in the not-for-profit sector, co-founding and co-directing New Partners for Community Revitalization, a NY not-for-profit organization whose mission is to advance the renewal of New York's low and moderate income neighborhoods and communities of color through the redevelopment of Brownfields sites. He is also former counsel for EPA's Region 2 Office.

Mr. Stanislaus has also been an advisor to other federal government agencies, including Congress and the United Nations on a variety of environmental issues. He chaired an EPA workgroup in 1997 that investigated the clustering of waste transfer stations in low income and communities of color throughout the United States. He has served on the board of the NYC Environmental Justice Alliance. In June 1994, as a member of United Nations Environment Programme - Environmental Advisory Council, he served as counsel to the United Nations' summit that examined environmental issues affecting New York's indigenous communities of the Haudaunosaunee Confederacy, as part of United Nations' International Year of the Indigenous Communities.

He received his law degree from Chicago Kent Law School and Chemical Engineering Degree from City College of New York. He was born in Sri Lanka and his family immigrated to this country to seek freedom and opportunity.

Last updated on April 28, 2015

Chairman SMITH. Thank you, Mr. Stanislaus.
And Mr. Greaney.

TESTIMONY OF MR. DENNIS GREANEY, PRESIDENT, ENVIRONMENTAL RESTORATION LLC

Mr. GREANEY. Thank you, Chairman. Chairman Smith, Ranking Member Johnson, and other——

Chairman SMITH. Make sure your mic is on.

Mr. GREANEY. Let me start it again. Chairman Smith, Ranking Member Johnson, and other distinguished members of the Committee, thank you for giving me the opportunity to testify on a recent incident at the Gold King Mine.

My name is Dennis Greaney. I serve as President and Managing Partner of Environmental Restoration and have served in that role since the company was founded in 1997. I've worked in the field of hazardous waste remediation and emergency response my entire career going back 30 years. We were one of the organizations involved in EPA's efforts at the Silverton site. We stand firmly behind our project management team and labor force there.

That said, as professionals who have dedicated our entire careers to cleaning up the environment, the end result was heartbreaking, to say the least.

If I may, I'd like to give you a bit of background about our company. Environmental Restoration is an environmental remediation response company that provides services to industry, commercial and state as well as federal agencies, and we're very passionate about our work and we're very proud and honored to have provided services to some of our nation's largest responses including the Deepwater Horizon, the aftermaths of Tropical Storm Lee, Hurricanes Sandy, Irene, Katrina and Rita, the space shuttle Columbia disaster, the 2001 anthrax response, both at the Hart Senate Office Building as well as the Postal Service's, and finally, the 9/11 attacks on the World Trade Center.

As a company, Environmental Restoration is committed to providing a safe work environment for our workers. That is our number one priority. We can demonstrate that through our experience modification rate, which is a .72 compared to an industry standard of one. We're nearly 30 percent safer than everyone else in our industry.

As with many EPA environmental removal projects, we were one of several organizations with assigned roles at the Gold King Mine. For the Gold King, Environmental Restoration was issued a Task Order. Our Task Order requested us to open the portal, which is the opening to the mine, as well as rehabilitate the mine opening to allow safe passage into the mine and then create safe access 75 feet into the mine tunnel. Within that Task Order, we had some sub elements which included a site preparation phase, which was construction of roads, staging areas, water retention and treatment ponds, water management for water that was assumed to be back behind some of the blockage within the mine, and again, the rehabilitation of the mine tunnel and opening up of the 75 foot of the mine tunnel.

Data provided to Environmental Restoration indicated that we were to anticipate water approximately six feet deep on the back

side of the blocked entrance within an approximately ten-foot-tall mine. The gallons estimated behind that blockage was 250,000 gallons. As we now know, there was much more water behind the blocked mine entrance than experts believed.

I was not personally involved or on the site when the release occurred. However, there's what I've learned. The release occurred during a preliminary trip to the mine and prior to Environmental Restoration initiating our work of opening the mine. During this preliminary trip, we were directed to remove rubble and debris that had caved in over the mine opening in an effort to expose the bedrock above the mine tunnel. The removal of the material was carried out with all due caution over a two-day period and under the guidance of the EPA on-scene Coordinator and abandoned mine representatives from the Colorado Inactive Mine program. The Gold King Mine release occurred following the removal of rubble from above the entrance.

The Gold King Mine incident is a terrible misfortune for the Animas River and for all those who live along it and make their living from it, and it was really gut-wrenching to watch the after effects of the release. This in no way reflects who we are as a company. We're very proud of our track record. We've conducted 1,300 Task Orders for the U.S. EPA as well as over 10,000 other projects for industry and commercial clients as well as other federal agencies. We're very grateful to have the opportunity to contribute to help safeguard people and the environment, and we hope to continue in that capacity for a long time.

I'd like to thank you for your attention and time, and I'm open to answer questions to the best of my ability.

[The prepared statement of Mr. Greaney follows:]

TESTIMONY OF DENNIS GREANEY
PRESIDENT AND MANAGING PARTNER, ENVIRONMENTAL RESTORATION LLC

HEARING ON HOLDING EPA ACCOUNTABLE FOR POLLUTING WESTERN WATERS

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

SEPTEMBER 9, 2015
RAYBURN HOUSE OFFICE BUILDING

Chairman Smith, Ranking Member Johnson, and other distinguished members of the Committee, thank you for giving me an opportunity to testify on the recent incident at the Gold King Mine near Silverton, Colorado.

My name is Dennis Greaney. I serve as president and managing partner of Environmental Restoration. I have served in that role since the company was founded in 1997. I am degreed in ecology and had three years of graduate studies in environmental toxicology. I have worked in the field of hazardous waste site remediation and emergency response for thirty years.

Environmental Restoration is made up of nearly 400 people around the country who, like me, are dedicated to assisting companies and government agencies respond to, and clean up, sites impacted by hazardous, toxic, or radioactive materials.

We were one of the organizations involved in EPA's efforts at the Silverton site. We stand firmly behind our project management team and labor force there. That said, as professionals who have dedicated our careers to cleaning up the environment, we were heartbroken by the mine release to the Animas River.

About Environmental Restoration, LLC

I will briefly describe the background about our company. Environmental Restoration is an environmental remediation and response services company that provides field remediation and response services for industrial, commercial, state and federal clients. Since 1997 Environmental Restoration has worked at the direction of EPA on more than 1,300 Task Orders requiring our services. In addition, Environmental Restoration has assisted on over 10,000 environmental projects for clients including the U.S. Army Corps of Engineers, the Department of Transportation, FEMA and hundreds of private sector companies.

We are passionate about our work and proud and honored to have provided services in some of our nation's largest responses including the Deepwater Horizon spill; the aftermaths of Tropical Storm Lee, Hurricanes Sandy, Irene, Katrina and Rita; the Space Shuttle Columbia disaster; the 2001 anthrax response to the Hart Senate Office Building and US Postal Services; and the 9/11 attacks on the World Trade Center.

Our services include Emergency Response and Site Remediation. Emergency Response consists of responding to emergency hazardous material situations such as oil and chemical spills, train derailments, over-the-road accidents involving hazardous materials, industrial facility accidents, and natural or man-made disasters.

Site Remediation includes decontaminating and/or demolishing structures and facilities. It also includes contaminated soil excavation and treatment, dredging and wetlands restoration, removal of asbestos, lead and mercury contamination, mine site remediation, and groundwater and vadose zone remediation. Over the years, our crews have handled millions of tons of contaminated soil and hazardous waste.

History

Our senior staff, including myself, are pioneers from the early days of environmental response and remediation work, averaging 30 years of applied experience remediating hazardous waste sites and responding to hazardous material emergencies. Our field teams include project managers, emergency response managers, health and safety specialists, site supervisors, foremen, field accountants, equipment operators, truck drivers and field technicians.

All Environmental Restoration field personnel are OSHA compliant, and many have specialty remediation training certifications. Our project managers and field staff are carefully selected based on their abilities and often possess experience resulting from long careers in this field. Collectively our management team has worked on more than 11,000 large-scale environmental projects and emergency response incidents for corporate and government clients nationwide.

Our company maintains offices across the country to provide our customers easy access to the technical and operational personnel and equipment needed for response and management of hazardous waste incidents. Our regional personnel are proven and experienced in developing and implementing solutions to meet clients' response and remediation needs. We provide deep expertise in field operations and the ability to respond efficiently and cost-effectively to projects nationwide.

Environmental Restoration has been prime contractor on approximately 20 federal government contracts since our inception. Most of these contracts required annual evaluation of our field performance by the government entities with whom we work. During these evaluations we are scored on Quality, Schedule, Cost Control and Management. Throughout our history Environmental Restoration has consistently performed at levels judged as Exceptional and Very Good, the two highest scores possible. As our safety and performance records demonstrate, Environmental Restoration is a very good contractor.

Safety

As a company, Environmental Restoration is committed to providing a safe work environment for our employees. We minimize risk by instilling a 'Safe Work Philosophy' in every employee on every job site.

Each employee understands the importance of working safely, and maintaining a safe project for their co-workers.

The true test of our efforts is our safety record, where statistics demonstrate our tremendous success at minimizing accidents and on-the-job injuries. Our Experience Modification Rate (EMR), which measures on-the-job accidents resulting in injuries, is .72 compared to the industry standard of 1.0. Our demonstrated safety record is almost 30 percent better than the industry average.

Training on hazard recognition and safe work practices is an integral part of our culture. We have a robust health and safety program functioning across all levels of our organization, including hands-on training and classroom and field instruction, in accordance with, but not limited to, Occupational Safety and Hazard Administration, National Fire Protection Association, Mine Safety and Health Administration, and Department of Transportation regulations.

Our work with EPA

In 2014 approximately 52% of Environmental Restoration's work was in support of EPA's Emergency and Rapid Response Services (ERRS) Contracts. Environmental Restoration is prime contractor to EPA in seven of the ten EPA Regions. In that role we work in support of EPA in 37 states across the country.

These competitively awarded EPA contracts require immediate and rapid response to emergency and time critical hazardous waste situations where human health or the environment is threatened. We are routinely tasked to respond to and remediate unstable or unsafe hazardous waste sites, and to respond to local, regional and national emergencies caused by natural disasters, abandoned facilities, chemical or oil spills, and terrorist attacks.

The Gold King Mine release

As with many EPA environmental removal projects, we were one of several organizations with specifically assigned roles to play in the effort at the Gold King Mine. Each EPA removal project is led by an EPA On-Scene Coordinator (OSC). The OSC serves as the lead for all responding contractors and agencies. Within this team, each contractor has contractually established roles and responsibilities, which are carried out under the supervision and direction of the OSC.

Environmental Restoration was issued a Task Order to open the portal of the Gold King Mine, rehabilitate the mine opening to allow safe passage of crews into the mine and through the caved entrance, and open and create safe access into 75 feet of the mine tunnel. Our Task Order specifically required:

- Site preparation, including construction of roads and staging areas;
- Water management of water and sludge impounded behind any blockage at the mine opening or deeper in the mine, which at the time it had been determined by others to consist only of a pool of water several feet deep;

- Rehabilitation of the mine opening; and
- Opening up 75 feet of mine tunnel.

Data provided to Environmental Restoration indicated that we were to anticipate water up to approximately 6 feet deep on the backside of the blocked entrance, and within the approximately 10 foot tall mine tunnel. This data suggested that there were approximately 250,000 gallons of trapped mine water. Based on this information, Environmental Restoration drafted a work plan establishing our method of accessing and pumping the trapped mine water, and completing our assigned Task Order work.

As is now known, there was much more water behind the blocked mine entrance than believed.

I was not personally on-site when the release occurred, but here is what I have learned: The release occurred during a preliminary trip to the mine, prior to Environmental Restoration initiating our scheduled field work. During this preliminary trip, we were directed to remove rubble and debris that had caved in over the mine opening. This was part of an effort to locate the bedrock above the mine tunnel. The removal of the material was carried out with all due caution over a two day period, and under the guidance of the EPA OSC and abandoned mine representatives from the Colorado Division of Reclamation, Mining and Safety's Inactive Mine Program. The Gold King Mine release occurred following the removal of rubble and debris from the entrance. It is my understanding that the release occurred approximately 20 minutes after the removal of the overburden and debris and during cleanup activities of the removed debris. It was during this cleanup phase that the initial waters were seen leaching from an area of the collapsed portal face, which was thought at that time to be above the water line within the mine. This trickle quickly escalated into the full release witnessed.

Our initial site response following the incident was focused on the immediate safety of all site workers and the public, quickly followed by re-establishing basic site access. Following the incident, the onsite team was stranded because the access road was washed out. Simultaneously the EPA OSC, with assistance from our Response Manager, used onsite radio communication to relay details on the release to the State of Colorado DRMS mine representatives. These men then implemented steps to further notify the public immediately downstream as well as officials, as discussed between the state officials and the OSC.

Conclusion

In conclusion, the Gold King Mine incident is a terrible misfortune for the Animus River, and for those who live along and make their living from it, and I commend the Committee for wanting to understand the details surrounding it. While my experience does not compare to those of the people whose livelihoods or water supplies were disrupted by the blowout, it was heartbreaking for me as an environmental professional to see the release on the Animus River.

This incident in no way reflects who we are as a company. We are proud of our track record on the thousands of environmental and emergency response projects we have worked on over the years. We

are grateful that we have had the opportunity to contribute to helping safeguard people and the environment, and we hope to continue to serve in that capacity for many years to come.

I would like to thank you for the attention and time you have given to this issue, and I am happy to answer to the best of my ability any questions you might have.

Dennis Greaney Bio

Dennis Greaney is President and Managing Partner of Environmental Restoration, LLC, a role he has held since helping to found the company in 1997.

Mr. Greaney has more than 30 years of experience in emergency response and environmental remediation. While leading Environmental Restoration, LLC, he has participated in the emergency responses to some of the most significant natural, environmental, and man-made disasters the country has faced during that period, including the Deepwater Horizon spill in the Gulf of Mexico, Hurricane Katrina, and the 9/11 attacks on the World Trade Center.

During the course of his career, Mr. Greaney has directed a comprehensive range of technical projects including more than 1,300 EPA task orders involving all types of treatment technologies and remediation services. His experience has allowed him to gain a widespread knowledge of procuring required resources and materials, managing multi-disciplinary personnel and subcontractors on simultaneous projects, planning and scheduling development, and writing required technical plans and reports. Additionally, Mr. Greaney has worked with other government agencies including the U.S. Army Corps of Engineers, FEMA, and the Department of Transportation, and hundreds of private sector companies, on a wide range of environmental-related mitigation and emergency response projects.

Previously, Mr. Greaney worked with the environmental remediation firms Riedel Environmental and Smith Technology. He studied Ecology as an undergraduate at the University of Illinois and Environmental Toxicology as a graduate student at Illinois State University. Originally from Swansea Illinois, he lives in St. Louis, Missouri. Mr. Greaney is active in several volunteer organizations including serving on the Advisory Board of Professional Science Master's Degree in Environmental Management at Southern Illinois University.

Chairman SMITH. Thank you, Mr. Greaney.
And Dr. Benn.

TESTIMONY OF THE HON. DONALD BENN,
EXECUTIVE DIRECTOR,
NAVAJO NATIONAL ENVIRONMENTAL PROTECTION AGENCY

Hon. BENN. Chairman Smith, Ranking Member, and Members of the Committee, my name is Dr. Benn. I'm a chemist by trade, and I'm the Executive Director of the Navajo Nation Environmental Protection Agency. Thank you for this opportunity to testify on a matter that is of great importance to the Navajo Nation.

On August 5th, 2015, United States EPA and other parties caused a massive release of toxic contaminants from the Gold King Mine. The toxic sludge flowed into San Juan River and through 215 miles of the Navajo Nation's territory. The Navajo EPA had a close relationship and a good working relationship with EPA—with U.S. EPA. However, recent events have shifted that relationship to one of lack of trust.

Today I would like to cover only a few of the many critical areas of concern for the Navajo people. These issues and others are covered more extensively in my written remarks.

First, the U.S. EPA delayed notification of the spill to the Navajo Nation. The nation was not informed of the release until August 6th. The U.S. EPA also demonstrated a complete lack of transparency. The initial U.S. EPA warning served to downplay the magnitude of the risk of human and animal health, and later reports by U.S. EPA were incomplete. Additionally, the Navajo Nation expressed concern for the U.S. EPA handing out and encouraging members of the Navajo Nation to fill out their standard form 95 to expedite settlement of their claims. These incidents have led to a culture of distrust by the Navajo Nation towards the U.S. EPA both among our farmers and our leadership.

I also want to lay out some of the devastating impacts to the Navajo Nation. However, I want to stress that all the impacts are yet unknown. First, families have the immediate impact of the additional costs of water delivery and other expenses to yet—despite this effort they saw their crops dying each day. Second, the loss of crops and replacement of those crops, their seeds and feed for their livestock and other expenses triggers a cycle of long-term economic losses for a nation that has already—already has 42 percent unemployment rate. Third, long-term health effects of the spill are unknown and not fully understood. Fourth, the Navajo Nation's culture and spiritual impacts are felt mostly pointedly in the disruption of our cultural principle of hozho that encompasses beauty, order and disharmony.

In light of the devastating impacts from the spill, both known and unknown yet, we need to act quickly and thoughtfully. We therefore ask for the following. Number one, we need resources to address the immediate emergency. This includes continued delivery of water and the delivery of hay to impacted ranchers. The EPA should also establish a relief fund for individual farmers—ranchers and farmers. We also need true emergency response coordination with FEMA.

Number two: We need resources to conduct our own water sediment and soil monitoring and the authority for Navajo EPA to do the necessary work. We propose to conduct these duties under the Navajo Nation as opposed to relying on the U.S. EPA. We will require an onsite lab and additional staffing to manage the sampling and lab performance.

Number three: We need assistance to create redundant and auxiliary water supplies and reservoirs to guard against future contaminations.

Number four: We will require funding assistance and resources to monitor, study and address the long-term health and environmental effects of the spill and return the river to its pre-spill state.

Number five: Due to U.S. EPA's conflict of interest, we seek to fare an independent assessment of the U.S. EPA's and others' roles in the spill and the establishment of a different lead agency. No other environmental bad actor will be given leeway to investigate itself and determine to what extent it will be held accountable. We believe another agency ,such as, FEMA should take the lead on the response and an independent body should conduct the investigation.

Again, thank you for your time and attention to this important issue. I welcome any questions from our Committee.

[The prepared statement of Hon. Benn follows:]

Testimony of Dr. Donald Benn
Executive Director
Navajo Nation Environmental Protection Agency
Washington, DC

Before the
United States House Committee
on Science, Space & Technology

Hearing on
Chemical Spill at the Gold King Mine in Colorado

Wednesday, September 9, 2015

Introduction

Yá'át'ééh (hello) Chairman Smith, Ranking Member Johnson, and Members of the Committee. my name is Dr. Donald Benn. I am the Executive Director of the Navajo Nation Environmental Protection Agency (NNEPA). The NNEPA is the Navajo entity charged with regulating, monitoring and enforcing performance with appropriate environmental standards throughout all of the Navajo Nation, including the exercise of our authority to limit or eliminate environmental contaminants emitted outside our current reservation boundaries into the Navajo Nation. We have separate and unique environmental standards that sometimes differ from federal standards and we have staff to perform much of our testing. My team has been on the ground monitoring the situation and taking samples of water and sediment since we were first notified of the spill. I am a chemist by trade. Thank you for this opportunity to testify before your Committee on the spill from the Gold King Mine in Colorado.

Our request of the Committee, Congress and the broader federal government is simple, that the USEPA and other parties responsible for the spill and response make us whole. Specifically, we request:

- Resources to address the immediate emergency;
- Resources to study and address the long-term environmental and health impacts of the spill;
- FEMA coordination;
- A critical, independent examination of the existing USEPA (defined below) organization with respect to coordination with the Navajo Nation, with serious consideration given to the creation of a Navajo USEPA Region or devolution of USEPA authority and funding directly to Navajo Nation's own Environmental Protection Agency to assume USEPA's responsibilities for the Navajo people; and
- A fair and independent assessment of the role USEPA played in the events leading up to the chemical spill from the Gold King Mine.

USEPA's Spill of Toxic Substances into a Key Water Supply for the Nation

On Wednesday August 5, 2015, the United States Environmental Protection Agency (USEPA), among others, caused a massive release of mustard-colored contaminants from the Gold King Mine (Mine) into Cement Creek. The toxic sludge—which includes contaminants such as aluminum, lead, zinc, arsenic, cadmium, manganese, iron, vanadium, and copper—flowed south from the Cement Creek into the Animas River, and eventually flowed into the San Juan River (River), a major surface water source for the Navajo Nation. The San Juan River flows through 215 miles of the Nation's territory, and provides much of the Nation's northern border. Eventually the San Juan spills into Lake Powell, which borders the Navajo Nation for an additional 65 miles south. We estimate it is 380 miles from the spill origin to Lake Powell. Counting Lake Powell, the Nation borders a total of 280 miles along the impacted River. The significant extent of exposure of spill contaminants to the Navajo Nation is compounded by the fact that much of this portion of the River is slower moving than upstream.

Upon learning of the incident the morning of Friday, August 7, the Nation's executive leadership team began an immediate response by placing the public on notice of a precautionary closure of the San Juan River to all uses. The Navajo Nation Division of Public Safety established an Incident Command Center, and the Nation's executive team monitored the movement of the plume of toxic sludge towards the Nation's waters. The afternoon of Friday, August 7, the Nation's executive team joined USEPA Region 8 officials for an update call, along with leadership from the other affected downstream jurisdictions. It was then that the Nation learned from USEPA Region 8 officials that we would be dealing with the effects of the spill "for decades" due to the nature of heavy metal contamination and its long-term health effects.[1]

It is estimated by USEPA that the toxic sludge reached the waters of the Navajo Nation on August 8, 2015. That same day the Nation learned that USEPA had miscalculated the volume of the spill. Rather than a 1 million gallon release, we were dealing with a 3 million gallon release. The chemical spill from the Gold King Mine continues to flow at a rate of 610 gallons per minute, as measured by the U.S. Geological Survey (USGS).[2] It is our understanding that the spill from the Mine remains ongoing. While there are treatment pools in place, we visually observed that the pools do not slow the aggregate flow of water from the point source. Using USEPA's more conservative estimate of 550 gallons per minute being released from the mine (provided at a public meeting at Nenahnezad Chapter House on August 15), and multiplying that by the number of minutes that have passed since the initial 3 million gallon release on August 5, we extrapolate that the total aggregate release is now well in excess of 20 million gallons.

Despite being assured by the USEPA on Friday, August 7 that "the water in Cement Creek and the Animas River near Silverton is clearing," I joined the Navajo Nation President Vice-President to view the Gold King Mine site of release in person.[3] We sought to coordinate our visit with USEPA Region 9, which covers the Navajo Nation in agreement with Region 6 (which

also straddles the Navajo Nation). Region 9 staff first indicated they would only take us to the confluence of Cement Creek with the Animas River in Silverton, Colorado, despite our request to visit the point of release. As we approached, we observed that the Animas River remained surprisingly orange. Upstream we observed that the river was a bright, opaque orange, that the river sediment was bright orange, and that rocks in the riverbed were stained bright orange.

After being rebuffed several times we were able to convince them to allow us to walk up to the mine adit. What we observed at the mouth of the adit was an unimpeded flow of what we later learned was 550 gallons per minute spilling freely and rapidly over the top of the one on-site treatment pond and cascading into the Cement Creek watershed. That rate of flow is now measured by USGS to be 610 gallons per minute. The water was an unusually bright, opaque orange, and the sediment at the mouth of the adit was an incredibly fine consisteney. The contaminants flowing from the mine did not appear to be "clearing" as reported by USEPA on Friday. Based on reactions by our Region 9 tour guide, this appeared to be the first time USEPA Region 9 staff visited the point of release.

Shortly thereafter the USEPA began taking more aggressive response actions. On August 10 USEPA staff attended public meetings at Aneth Chapter and Oljato Chapter, provided information about the spill, and handed out Standard Form 95 to facilitate the filing of Federal Tort Claims Act (FTCA) claims for damages. On August 11 the USEPA finally apologized for their role in the release, and pledged to take responsibility for injuries caused by the release.[4] On August 12 the USEPA and the U.S. Bureau of Indian Affairs (BIA) deployed water tankers to affected Navajo communities. On August 13 USEPA Administrator Regina McCarthy came to the Navajo Nation to discuss the incident with Navajo leadership.

Immediately after the release, and in our subsequent conversations with USEPA, we have asked them for a full spectrum analysis of the contaminants being released from the Mine. To our knowledge, USEPA has never done this. Instead they tested for a limited list of contaminants, including iron, aluminum, calcium, magnesium, potassium, lead, manganese, zinc, copper, sodium, barium, arsenic, vanadium, molybdenum, silver, chromium, cobalt, antimony, nickel, mercury, cadmium, and beryllium. Their reasoning for testing for these limited contaminants is unclear. USEPA started daily sampling for these contaminants around August 8, 2015, at 11 locations within the Navajo Nation. As of last week, they dropped the sampling to 5 locations, twice per week. We are uncertain where they will be taking these samples. What we have experienced thus far is a USEPA focus on water upstream of the Navajo Nation. We hope USEPA will take our water quality into consideration as they undertake long-term monitoring.

When the plume of toxic sludge was released from the Gold King Mine, USEPA initially chose iron as its marker to track the movement of the sludge. The orange-mustard color of iron allowed easy visual aspect tracking, but USEPA lost the plume shortly after it entered Navajo waters in Nenahnezad because the plume lost its distinguishable color. USEPA then had to choose a

different marker, so it chose aluminum. It is not clear why USEPA chose aluminum, which is an unpredictable element. The Navajo Nation chose lead to track the plume. Lead is a predictable element that is consistent throughout the River. We thus believe it is a good marker to identify the presence of the plume released from Gold King Mine, which we suspect is now lying at the bottom of our River.

The settling of heavy metals to the riverbed gives the illusion that contaminant levels have decreased, but settled heavy metal contaminants can be disturbed and entered back into solution after a storm or increased water flow event. Thus these events can once again increase the level of heavy metal contaminants in our River water. We observed this in the August 12 storm event, where USEPA data reflected water quality exceedances in the hours and days after the storm event. Indeed, that event allowed us to observe the presence of dissolved aluminum at levels higher than we have ever seen in the River, even during the usual storm event spikes. Our hypothesis based on this observation is that other contaminants like lead, mercury, beryllium, and chromium are also higher than usual, and that the release from the Gold King Mine has forever changed the concentrations of chemicals in the San Juan River. This requires additional study for which we need funding. This unknown is an additional basis for our reluctance to open our waters to all uses. We need to understand this new River. As part of that, we will seek to add a water quality standard for mercury. We are concerned that USEPA, which has to approve our water quality standards, may not approve the development of such a standard.

Surrounding jurisdictions have reopened the River to all uses, including livestock use and drinking water use, but those jurisdictions review a narrower list of contaminants than the Navajo Nation does when assessing the quality of its water. Our considerations are broader and different, and so our decision to open the water to various uses will be made independently once our standards are met and once we have sufficient comfort with respect to yet unknown risks of using the water. Navajo has two public irrigation canal points on the San Juan River that provide water for farmers. The Navajo Nation has opened one of those canal points for the limited use of irrigation (and not animal or human consumption), but the other canal remains closed due to the lack of trust local farmers have of USEPA and its data. With USEPA as the cause of this event, many farmers have lost their trust in the USEPA and in statements they make. The Navajo Environmental Protection Agency will continue to monitor River data derived from our own samples and USEPA's samples in order to make a determination as to whether the water is usable beyond limited irrigation. Plants and animals metabolize heavy metals differently, and we simply do not know enough about those processes to know the level of exposure we are subjecting ourselves to by irrigating our crops with water that carries both dissolved and undissolved heavy metals. Water sampling only detects the presence of dissolved metals, whereas we understand that the San Juan River carried a significant sediment load even before its sediments were contaminated by the Gold King Mine spill. We have sought assistance from USEPA in taking water and sediment samples ourselves, but they have wanted to first know the

full details of our methodologies and approach. In order to ensure fair and full analysis to capture the full scope of impact, we have taken measures ourselves to fund our own sampling program, but we need help continuing those efforts over the long term. Indeed, our sediment sampling activities are completely new, and thus are currently unfunded except through the generosity of our Tribal Council and private donors.

USEPA's Creation of a Culture of Distrust

The NNEPA works in close partnership with USEPA to facilitate the Nation's twelve environmental programs, which are largely if not completely funded by the USEPA. NNEPA has assumed Treatment as a State (TAS) authority under various sections of the Safe Drinking Water Act and the Clean Water Act, as well as primacy for various water regulatory authorities in 1995. In my role as NNEPA Executive Director, I oversee a staff of about 80 employees. A good and close working relationship with USEPA has always been critical to the success of the NNEPA. However, recent events relating to this spill have led to a complete shift in that relationship as USEPA has sought to quiet our legitimate concerns, and has made repeated missteps in their response efforts relating to the incident triggered by their own actions. From day one, USEPA has assumed a posture of mitigating losses even while taking the lead on the incident investigation and emergency response. We have grave concerns about the strong conflict of interest USEPA has with respect to this investigation and the emergency response. No other environmental bad actor would be given this same amount of leeway to investigate itself and determine to what extent it will be held accountable. We are encouraged that USEPA's Office of Inspector General will be reviewing this incident, but we believe another agency should be made lead on the response, and an independent body should conduct the investigation of the incident.

To the issue of distrust, our first point of concern with USEPA is with its delay in notifying the Nation of the spill. The spill occurred the morning of August 5, 2015, but the Navajo Nation was not informed of the release until August 6, a full day later, and the Nation was informed of the release not by the USEPA, but by the State of New Mexico's Technical, Construction and Operations Branch. The USEPA did not seek to notify the Navajo Nation of the release for almost two full days. This is a completely unacceptable delay in notifying a downstream jurisdiction. The Nation's waterways compose at least two-thirds of the area of river contaminant exposure, and this does not include the additional 65 miles of exposure we have along the shores of Lake Powell.

Our second point of concern is with the lack of transparency that USEPA provided with respect to the scope and nature of contaminants spilled. Our initial warning from USEPA was of an "acid mine drainage spill in the Animas River north of Durango" of "[a]pproximately 1 [million] gallons."[5] USEPA's initial fixation appeared to be with pH levels, and at around midnight on Friday, August 7 USEPA reported that contaminated releases were at a pH of approximately 4.8, and provided the pH of black coffee (4.5) as a point of reference.[6] This served to downplay the

magnitude of risk to human and animal health, and later reports by USEPA of released contaminants were incomplete. Indeed, the media was receiving faster and fuller information from USEPA than the Nation and other affected jurisdictions. For example, the New York Times reported the spill hours before USEPA provided the Nation with notice of the spill, and media sources reported USEPA confirmation of the presence of arsenic in the contaminants release from the mine on Friday, August 7 whereas USEPA still had not reported the presence of arsenic to the Nation by Sunday, August 9. Additionally, the graphs USEPA provided on Friday showing the presence of lead provided a misleading flat line depiction, suggesting lead levels did not change with the release. However, with the low baseline average concentration of lead in the river at 14.71 units for Cement Creek above Silverton, for example, and the first increment of measurement on the graph of 2000 units, the concentration of lead could quadruple or sextuple, and the graph provided by USEPA would not visually reflect this spike.

USEPA's subsequent actions further generated distrust and concern by the Nation due to a continued lack of transparency and forthrightness. For example, USEPA complained about treatment by a Shiprock Farm Board Member, whom their staff found threatening, but who we later discovered was trying to prevent the use of oil contaminated water on fields. To our great consternation, the President and Attorney General later indeed found petroleum residue on and inside the tank provided by USEPA and identified as contaminated by the Farm Board Member. This discovery came within days of the President and Attorney General receiving in-person and telephonic assurances from a USEPA on-scene representative that the tanks provided by USEPA were steam cleaned and filled with potable water from a municipal water source that does not draw from the San Juan River. Rather than investigating the complaint raised by the Farm Board Member (one of our elected tribal officials) USEPA responded by immediately withdrawing all of its staff and resources, including all sampling activities along the River, from the community the Farm Board Member represents. That community happened to be Shiprock, the most populous Navajo community along the San Juan River, and also the community with the greatest need for assistance from the USEPA in the face of the contamination of the River.

Additionally, within days of the President announcing that the Nation would be suing USEPA, they had staff on-site handing out Standard Form 95 and encouraging members of the Navajo Nation to fill out the forms to expedite settlement of their claims for damage, injury, or death pursuant to the FTCA. The Attorney General reviewed the form and identified plain and clear language on the form attesting that individuals submitting the forms would be filing the forms in pursuit of "FULL SATISFACTION AND FINAL SETTLEMENT" of their claims for damages and injuries that yet remain unknown. USEPA was embarrassed by the backlash in response to their handing out of the forms and has sought to tamp this down by explaining that people who submit the form are simply starting a process for settling their claim, and USEPA provided assurances that claimants can amend their claims later. They additionally pointed out that people have two years to file their claims. However, I have been informed by the Attorney General that

this opportunity to amend a claim or to file a claim within two years of the incident does not change the fact that once a claimant cashes a check received in final settlement of a claim submitted via Standard Form 95, that individual will be putting him or herself in the position of being unable to file for additional compensation for damages and injuries arising from the Gold King Mine release because the claimant will have fully and finally settled their claim with USEPA. There does not appear to be a way for individuals to amend an FTCA claim once final settlement is reached, and that is a significant concern because of the anticipated long-term effects and attendant damages and injuries that may come from long-term heavy metal contaminant exposure to our people.

This is a vexing situation for our people because the economics of farming makes the timely cashing out of harvests time-urgent. Our farming families were expecting to sell their harvests along a relatively predictable timeline that was disrupted by the closing of the San Juan River to irrigation use. They relied on the predictability of this timeline to defer bills and expenses until harvest time, and now that time is passing and many of them need their anticipated harvest returns immediately to catch up on bills and buy school clothes, for example. Yet if they fill out Standard Form 95 and, assuming USEPA takes less than the six months they are allowed to process claims, they receive a settlement check quickly, they likely will not defer cashing that check while they wait for additional damages or injuries to accrue. Our President, Vice-President, and Attorney General have thus asked USEPA for an interim claims process that will allow for ongoing claims filings, and our Attorney General has asked for a U.S. Attorney General opinion confirming that the filing of Standard Form 95 and the settling of a claim filed under that form or process does not in fact fully satisfy and settle the claim as the plain language of the form and the FTCA itself indicates, but none of this has been forthcoming.

USEPA's failed response is also blocking other federal actors from assisting us in our time of great need in responding to the chemical spill from Gold King Mine. The Navajo Nation contacted the Federal Emergency Management Agency (FEMA) as a direct result of our declaration of emergency, but also because of our lack of confidence in the USEPA. However, two weeks ago a confirmed coordination call with FEMA was cancelled by the Agency. The stated reason for the cancellation was that USEPA was the lead federal agency for the response. Adding insult to injury, on Friday, September 4, FEMA denied the Nation's formal request for a Federal Disaster Recovery Coordinator. Given USEPA's blundering of the response effort, the Nation has a more than adequate basis for requesting that FEMA take over as lead responding agency. Meanwhile, it is our understanding that the BIA, which provided critical response assistance to the Nation, is withdrawing its support in part due to USEPA's resistance in reimbursing BIA for its efforts.

These many instances of failure by USEPA in responding to this incident in an honest and forthright manner suggestive of true regret for the occurrence of the incident and a basic ethic of taking responsibility for one's actions has led to a culture of distrust on Navajo Nation with

respect to USEPA, both among our farmers and our leadership. Yet the NNEPA continues to have the trust of our farmers and our leadership, and our farmers are seeking honest data assessments and technical answers from us. We can and will do this better than what we've observed by USEPA, and we care deeply about protecting the health and welfare of our people. I thus ask that you provide NNEPA with the local authority and resources to do the work that USEPA would otherwise do to assess the injury, study mitigation options, and undertake mitigation efforts with respect to the Gold King Mine chemical spill. This is done in other tribal program contexts like Indian Health Services where local tribal entities assume federal authority through 638 contracts. Alternatively, the NNEPA would be pleased to have our region recognized separately from Region 9 and Region 6. The carving up of our Nation into multiple USEPA regions stymies our ability to generate quick responses and solutions in the face of an environmental emergency, as here. We are already expanding our scope of work into the realm of sediment testing, but we do need additional funding to facilitate that work, and to provide our farmers and our leaders with the answers they deserve, and with answers they can trust.

Continued and Urgent Threat of Point Source

Further contributing to the culture of distrust towards USEPA is the fact that USEPA knew of the threats posed by the Gold King Mine and its surrounding mines for quite some time, yet it failed to take measures to protect those of us downstream. Even worse, in the wake of this incident and the horrible impacts it has visited upon the Navajo Nation, USEPA's words and actions suggest that they do not believe or acknowledge that the Gold King Mine and its surrounding mines are a legitimate threat to the Nation. But we are living through the very present and tangible reality of that threat, and the bookend on our seope of injury is not in sight. As USEPA stated early on, we will be dealing with the effects of USEPA's Gold King Mine chemical spill "for decades." Meanwhile, Gold King Mine is just one of over 300 abandoned hardrock mines in the heavily contaminated 140-mile-area known as the Upper Animas Mining District (District).[7] The District includes private, federal, and state lands, and the town of Silverton.[8] Gold King Mine was twice considered for inclusion on the National Priorities List (NPL), both as part of the District, and as a narrower carve-out from the District, and the recent spill was preceded by two devastating spills in the 1970s.

The Mine's first Superfund site assessment was conducted in the 1990s, and the assessment concluded, "that water quality standards were not achieved" in the District.[9] The assessment also identified "severe impacts [of the District] to aquatic life in the Upper Animas and its tributaries."[10] Despite the serious harm being caused by the District, USEPA postponed listing the District on the NPL in order to allow a "community-based collaborative effort" to clean up and mitigate harm from the District "as long as progress was being made to improve the water quality of the Animas River."[11]

Yet in 2005, the "water quality ha[d] declined significantly" in the area, and so in 2008, USEPA performed another NPL assessment, this time on the Upper Cement Creek alone.[12] The study again confirmed, "that the area would qualify for inclusion" on the NPL.[13] Despite the additional confirmation that the Mine area should be listed on the NPL, "EPA postponed efforts to include the area on the National Priorities List," again "after receiving additional community input."[14] USEPA's repeated denial of the facts with respect to the level of harm posed by the Gold King Mine and its surrounding mines has placed downstream jurisdictions such as the Nation at undue risk. This further contributes to a lack of trust of USEPA to protect the health and well-being of Navajo people and the Navajo Nation from environmental threats. If the local community wishes to avoid Superfund listing for the site, the threat of the site should be confined to their own backyards, and what is sent downstream to the Nation and its neighbors should be made safe.

The threat of a spill from the District will remain under the existing management scheme. There were two previous releases of hazardous mine waste from the area in 1975 and 1978. In 1975, "50,000 tons of heavy-metal-loaded tailings" were dumped into the Animas River.[15] And in 1978, "500 million gallons" of water contaminated with "tailings and sludge" spilled into the Animas River.[16] The damage caused by the Upper Animas Mining District has gone on far too long. The chemicals found in the District pose significant human health risk as they contain known carcinogens and elements that can affect major organ systems such as cardiovascular, respiratory, gastrointestinal and reproductive systems. To provide a sense of magnitude of exposure, one report of EPA data indicated that lead was found near the Cement Creek/Animas River confluence "at more than 200 times higher than the acute exposure limit for aquatic life, and 3,580 times higher than federal standards for human drinking water" and arsenic was found "more than 24 times the exposure limit for fish and 823 times the level for human ingestion."[17]

The waste from the mines in the Upper Animas Mining District is also harmful to wildlife. An April USEPA risk assessment found that "[m]etals concentrations in the Animas River below Mineral Creek have eliminated virtually all fish down to Elk Creek and all cutthroat and rainbow trout down to Cascade Creek, where only a small community of brook and brown trout exist," and "that the benthic invertebrate community is impaired in most sections of the Animas River, Cement Creek and Mineral Creek."[18] The District is making portions of the Animas River uninhabitable for certain wildlife. Negative implications for other wildlife in the food chain are even broader.

Meanwhile, based on our extrapolation of known data, over 20 million gallons of aggregate contaminated flow has spilled from the Mine since August 5. If the District does not become a Superfund site, contaminants will continue to pour freely into the Nation's waters, the concentration of contaminants in our waters will increase, and the duration of exposure for our people will extend even further into the future. Metals poison people slowly, and sediments eventually make their way downstream. We are thus gravely concerned that the metals coming from Gold King Mine and the District are making their way down to us, and will settle in our

slow waters. We are also concerned that efforts to flush contaminants out of the Farmington area flushed contaminated sediments into our territory, and that those contaminants will remain here for a long time. We do not want our people to be poisoned by the heavy metals that have arrived or that will arrive in our waters from the District, and so we urge you to do what you can to help us secure NPL listing for the District.

What's at Stake: The San Juan River Basin before the USEPA Spill

The San Juan River Basin is perhaps the Navajo Nation's the richest agricultural region across our large reservation. When our leaders negotiated our release from internment by the federal government at Fort Sumner in the Treaty of 1868, they were certain to include the San Juan River and its adjacent rich farmlands within our Nation's boundary. The reliance of our people on the River and the significance of the River to our people cannot be overstated. The San Juan River Basin is a bastion for ancient Navajo seed strains that our people have carefully refined and designed to thrive in our arid region since time immemorial. We grow four types of corn, each used for a specific purpose in our ceremonies, and those seeds are protected by the strong culture of farming that has persisted in the San Juan River Basin. Navajo cornhusks are mixed with tobacco to create ceremonial smoke, and our corn pollen is used as an essential element in all Navajo ceremonies. One of our corn seed strains is utilized in our critical *kinaalda* ceremonies (the coming of age ceremonies for our women). We also grow an array of heirloom fruits and vegetables that our people eagerly anticipate selling and purchasing during our popular fair season each fall. Those fruits and vegetables are shared over family tables, and are a part of the cultural glue that keeps our families and way of life intact. Families travel for hours across the Nation to the San Juan River Basin to access these ingredients for our ceremonies and celebrations.

The Navajo Nation as a whole is a largely agricultural society. Our territory spans over 27,000 square miles, and is larger than 10 U.S. states. Much of the Nation is rural, and our people have traditionally farmed and ranched, since pre-contact and beyond. Our colonial neighbors knew us for our agricultural bounty. Farm culture on the Nation remains strong today. According to the U.S. Department of Agriculture's 2012 Census of Agriculture, the Nation has 14,456 farms on our land, over 99 percent of which are operated by our own people.[19] According to our Department of Agriculture, there are approximately 1,500 farms in the Shiprock Agency alone. The community of Shiprock, which straddles the banks of the San Juan River, is the largest population center for the Nation.[20] The average size of our farms is 1,174 acres.[21] Most of our farms grow traditional corn, hay, squash, and watermelons.[22] The average market value of our farm products is $5,087 per farm, but we have 26 farms that produce $100,000 or more in annual sales.[23] The overwhelming majority of our farms are family or individual owned.[24] Many of our farming families live adjacent to their farmlands. Roughly three-quarters of our farmers list farming as their primary occupation, and almost half of our farm operators indicate that they

spent no days working off their farm.[25] This demonstrates how vulnerable our farmers' livelihoods are to the whims of the produce and hay markets, and to weather and water conditions. Most of our farmers are long-time farmers who have been working on their farms for 10 years or more.[26] Simply put, farming is and always has been a way of life for our people.

We also have a great number of cattle and sheep ranchers. Specifically, we have 5,767 cattle ranch operations and 9,328 sheep ranch operations on the Nation.[27] The BIA estimates that we have 1,175 grazing permit holders in the San Juan River area, some of which likely run both cattle and sheep ranching operations as is customary among Navajos ranching families. With sheep as our national cuisine and rodeo as our unofficial national sport, farming and ranching are deeply embedded in our culture, and indeed are the backbone of both our culture and economy.[28]

Successful farming and ranching operations are reliant on rain, particularly in our arid region where there is very little water distribution infrastructure in place. Our farmers rely heavily on the San Juan River and ditch irrigation practices to keep their fields hydrated and their crops growing and yielding at a high rate. The Nation has faced a long-standing drought, but this summer we experienced heavy rainfall. Indeed, this summer was the first time since the drought began that our rainfall reached pre-drought levels. There was a sense of hope and joy among our people as we saw our land turn green once again and saw our crops and livestock respond with increased size and weight. Before the USEPA spill, there was tremendous hope that this harvest season could bring about strong financial returns. Further boosting expectations was the continued rise in cattle prices.

Adverse Impacts Borne by the Navajo People

The Navajo Nation's impacts are felt most in the disruption of our cultural principle of *hozho*, which encompasses beauty, order, and harmony, and expresses the idea of striving to maintain balance in the Navajo universe. The impairment of the River and the adverse impacts to our farmers and ranchers, and our community as a whole, will mark a moment of community trauma that will be remembered for years to come. This modernized trauma will compound our already significant historical trauma.

We are concerned about the mental health impact the spill is having in the short term and will have in the long term. Our Department of Health has identified that we are experiencing grief and loss at both an individual and community level due to the trauma of the spill. It is not known how long our people will remain in the various stages of trauma. We are saddened as a community to see our Navajo elders cry and to see the food security of our people disrupted. Our farming families in particular have lost a significant portion of a full growing season's worth of work, and during a season where there were joyful expectations for the first time in a long time of a bountiful harvest. Now these families have to look at their dead and dying crops each day, and are constantly reminded of the loss of their sweat and hard work.

The lack of a swift and adequate response from the federal government also makes our people feel like the federal government doesn't care about them or their livelihood. For this community, this response from the federal government is not surprising or new, but is just as crushing now as ever. Relatedly, we have seen frustration in our communities along the River rise, and our Department of Health has even observed a spike in incidents of domestic violence. The crushing stress of this incident, along with the significant unexpected financial loss suffered by our farmers and ranchers, and the sense of powerlessness and hopelessness arising from the failed response has upended our community's balance.

Our farmers and ranchers and our traditional people felt the most immediate impact from the spill. Our farming families consume these farm-raised goods as a matter of subsistence. After the San Juan River—the primary and often singular water supply to our Northern Navajo communities—was closed to use by farmers and livestock owners for irrigation and livestock use, many of our farmers and ranchers had to expend their own funds to haul water to their crops and animals to keep them alive or to keep them from stalling in growth. One family operates a 22-acre farm and was driving 80 miles a day non-stop to supply their fields with water. Despite these efforts, they were only able to save one acre of their crops. They chose to save Navajo corn and melon in order to mitigate cultural and spiritual impacts that will come from the expected broad losses from crop failure in the San Juan River valley due to the Gold King Mine spill.

Though the River has been reluctantly opened for limited irrigation purposes in order to save the crops of those farmers willing to assume the risk of watering their crops with contaminated water laced with heavy metals, the Navajo Nation has not opened the San Juan River for livestock use. In order to keep their livestock from drinking the River water, ranchers have had to reign in their livestock. Those ranchers now have both the expense of hauling water and purchasing hay for their livestock. USEPA is fully pulling out resources to assist our farmers and ranchers with water and hay, but we still sorely need that assistance. If USEPA won't help us, we ask that the funds to deal with this crisis be sent directly to the Navajo Nation. At the very least, USEPA, the party responsible for this situation, should be taken off as the lead responding agency. Their significant conflict of interest puts them in an awkward position of trying to minimize mitigation efforts in order to keep costs down, and incentivizes downplaying the adverse effects caused by the Gold King Mine spill. FEMA would make a much better lead agency, as would the BIA.

Our traditions and culture are kept alive by our San Juan River valley farmers' growing of heirloom Navajo fruits and vegetables, and sharing in traditional harvests during our annual fair season brings our families together. Loss of replacement seeds places our farmers' slowly refined seed strains at risk because local seed banks won't be replenished. The loss of heirloom seed strains will be significant because those seeds are developed to resist the harsh, arid climate of our region. Monocultures of a crop are susceptible to complete extinction if affected by a single event. Once a breed of plants is extinct, those genes are lost forever. Replacement of seeds that

have acclimated to the local climate is more difficult and more expensive than general seed replacement.

In addition to destroying crops critical to our prayers and ceremonies, the contamination of our sacred River has desecrated an important male deity for our people, of which the River stands as a physical embodiment. Its contamination by the spill has been a significant spiritual blow and disruption to the natural order of our society. The San Juan River sustains our culture by watering our many unique species of Navajo corn plants that are critical to our prayers and ceremonies. A lack of supply of these crops raises the price of these items for traditional Navajo families. The Navajo Nation Historic Preservation Department (HPD) has been informed that local Chanters' ceremonies and prayers have been negatively affected by the spill and subsequent contamination of the River, which also affects other cultural resources within the Navajo Nation. HPD has thus expressed extreme concern about the contamination of the River, as it is a Traditional Cultural Property to our people with multiple layers of significance.

Contamination of the River is also a blow to our economy. The Navajo Nation faces a daunting unemployment rate of 42 percent.[29] Yet along the San Juan River, many of our people are able to make a life for themselves and support their families through farming and ranching. Many of our farmers create additional economic value for themselves by carefully growing profitable organic crops, or raising grass-fed and organic beef or mutton product. Their livelihoods have been significantly disrupted by the spill. The promising harvest our people were looking to with hope and joy has been obliterated. Growing cycles and field rotations have been disrupted, and farmers who are used to producing their own farm goods will now need to buy fruits and vegetables for themselves and hay and alfalfa for their livestock in order to replace what was lost. This is impacting even farmers who have been able to salvage their farm goods because there is now a stigma against fruits and vegetables grown along the San Juan River.

Lead, arsenic, mercury, chromium, cadmium and beryllium are contaminants known to be toxic and dangerous to humans, animals and plants, and all of these heavy metals are present in the ongoing chemical spill from the Gold King Mine. The long-term effects of heavy metal poisoning from direct exposure are largely unknown, especially with respect to impacts on plants watered by contaminated water. It is not known if or to what extent human health will be impacted by consumption of farm products irrigated by water contaminated by heavy metals. These same concerns apply to human health effects from eating livestock that consume water contaminated by heavy metals. We hunt and fish these animals to put food on our tables and as part of our traditional cultural practices. As such, effects on wildlife need to be monitored.

Despite many unknowns, we do know that lead poisoning occurs by eating or drinking water or food that contains lead, or ingestion of dust or soil contaminated by lead.[30] Lower level exposure of lead to children over time "may lead to reduced IQ, slow learning, Attention Deficit Hyperactivity Disorder (ADHD), or behavioral issues."[31] Lead also affects the kidneys, heart,

and reproductive system, and developing fetuses are especially sensitive to the effects of lead exposure.[32] The effects of lead poisoning may not be noticed for many years, and lead does not break down over time.[33] We also know that "[a]rsenic cannot be destroyed in the environment": it can only change its form.[34] High levels of arsenic can result in death.[35] "Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, [and] damage to blood vessels."[36]

There is much to be studied to assess our level of risk and contamination as a society. Even in the face of so many unknowns, what we do know is that our River and our people are forever changed by the chemicals spilled from the Gold King Mine. We want to protect our Navajo citizens, our natural resources, the Navajo way of life, and most importantly our future generations from these unknowns. We hope you will assist us in that effort by helping fund the necessary long-term studies.

Significant Need for Resources

We did not cause this spill, nor did we request that it impact our people, our livestock, our lands and our way of life. At this moment, we simply request assistance from the responsible parties to make us whole and return the beauty and *hozho* to our River and to our people. The responsible parties can assist with immediate concerns as well as address the more long-term impacts. We request Congress's assistance to compel the responsible parties to provide adequate and sufficient long-term remediation. We also request that Congress allocate and direct resources to address both the short-term and long-term impacts of the devastating Gold King Mine spill.

In the short-term emergency response, we request assistance with the continued delivery of water for both livestock and farming. We also request assistance with hay delivery for impacted ranchers. Despite our continuing urgent need for water and hay, beginning Saturday, September 5, USEPA and BIA began withdrawing assistance.

Additionally in the short term it is critical that the USEPA establish a relief fund for individual farmers and ranchers and address the issues of Standard Form 95. Specifically, we have requested an interim claim form or process as opposed to the existing Standard Form 95.

In the near term the Navajo Nation would like to guard itself from future contaminants and be prepared if and when more contaminants arrive from upstream. We thus request assistance for creating redundant and auxiliary water supplies, and reservoirs. We also request true emergency response coordination with FEMA, as opposed to sole reliance upon USEPA as lead federal responding agency.

We will need the resources to conduct our own water and soil sediment monitoring, especially given the level of mistrust with the USEPA. We propose to conduct these duties under the

Navajo Nation, as opposed to relying upon the USEPA. We will require an on-site lab, and additional staffing to manage the sampling and lab performance.

Perhaps most importantly, the long-term health impacts have yet to be quantified, but we believe they could be substantial. We will need assistance monitoring health impacts as well as the resources necessary to fund this monitoring effort. In the event individuals' long-term health is impacted, we will need resources to fund treatment.

Finally we will require assistance to fully clean up the River and return it to the pre-spill state. This will require extensive planning and study prior to implementation.

Conclusion

The inadequate response from the USEPA, FEMA, and the Obama Administration in general is not an unprecedented single event for the Navajo people. Instead, it is yet another instance of our people being less than a priority to the federal government. This experience most vividly calls back memories of our experience with uranium. There too our people were not consulted or compensated for damage caused by mines, and there too we were not warned of the risks related to the threats from the mines. We have had to live with the legacy of yellow dirt, now we face the legacy of yellow water. The federal government needs to handle this contamination very differently, but we are not seeing that happen in USEPA's current actions.

As you can see from our testimony, water is essential and sacred to the Navajo people and the Navajo Nation. The loss of water has the ability to deeply and adversely affect the financial, cultural, emotional and physical condition of the Navajo people. Our people are experiencing mental and emotional anguish from having a trusted water source suddenly and unexpectedly contaminated with strange elements that have changed our River forever. Our people feel uncertain of their health and well-being, as well as that of our future generations. The Navajo Nation does not want this to happen again. With your help, we can prevent this, and provide a safe and secure future for our people—especially those directly affected by this contamination event.

Our request is simple, that the USEPA and other parties responsible for the spill and response make us whole by providing us with resources to address the immediate emergency, resources to address the long-term environmental and health impacts of the spill, FEMA coordination of the response, critical examination of USEPA's organization with respect to the Navajo Nation, and an independent analysis of USEPA's role in causing the spill so that USEPA can be held accountable for its actions in the same manner as any other environmental bad actor.

Ahéhee.' Thank you for your time and attention to this important issue.

End Notes

[1] Telephone Call with Shaun McGrath, Administrator for USEPA Region 8, and Joan Card, Senior Policy Advisor for USEPA Region 8 (Aug. 7, 2015).
[2] http://fox6now.com/2015/08/13/gold-king-mine-owner-i-foresaw-disaster-before-epa-spill-into-animas-river-in-colorado/
[3] E-mail from Harry Allen, Chief, Emergency Response Section, USEPA Region 9, to Russell Begaye, President, Navajo et al (Aug. 7, 2015, 11:58 PT) (on file with NNDOJ).
[4] http://www2.epa.gov/goldkingmine/epa-administrator-gina-mccarthy-8112015-remarks-gold-king-mine.
[5] E-mail from Harry Allen, Chief, Emergency Response Section, USEPA Region 9, to David Taylor Attorney, Navajo Nation Dept. of Justice (Aug. 6, 2015, 10:58 PT) (on file with NNDOJ).
[6] E-mail from Harry Allen, Chief, Emergency Response Section, USEPA Region 9, to Dr. Donald Benn, Director, NNEPA (Aug. 7, 2015, 11:58 PT) (on file with author), attachment "PHstatement8 7.docx."
[7] http://www2.epa.gov/region8/upper-animas-mining-district
[8] http://www2.epa.gov/region8/upper-animas-mining-district.
[9] http://www2.epa.gov/sites/production/files/2015-08/documents/goldkingminewatershedfactsheetbackground.pdf at 2.
[10] http://www2.epa.gov/sites/production/files/2015-08/documents/goldkingminewatershedfactsheetbackground.pdf at 2.
[11] *Id.*
[12] *Id.*
[13] *Id.*
[14] *Id.*
[15] http://www2.epa.gov/sites/production/files/2015-08/documents/goldkingminewatershedfactsheetbackground.pdf at 1.
[16] *Id.*
[17] http://m.startribune.com/nation/321518301.html
[18] http://www2.epa.gov/sites/production/files/2015-06/documents/upper-animas-bera-fact-sheet-april-2015.pdf at 1
[19] 2012 Census of Agriculture, USDA, National Agricultural Statistics Service, "American Indian Reservations" (Table 1) at 17.
[20] See 2010 population census data on Shiprock from the U.S. Census Bureau at https://drive.google.com/file/d/0B9Ys0__F67YfaS1UOWxUQ1hydm8/view?pli=1 (shows a population of 9,226).
[21] 2012 Census of Agriculture, USDA, National Agricultural Statistics Service, "American Indian Reservations" (Table 1) at 17.
[22] Id. at 95, 121. The Navajo Nation Department of Agriculture reports that the crops in the impacted region include organic Navajo corn, sweet corn, alfalfa, squash (acorn, cushaw, banana, butternut, zucchini, hubbard, spring, crooked neck, and more), potatoes, pinto beans, green beans, peas, tomatoes, cucumbers (including multiple several varieties), several varieties of chili, melons (cantaloupe, honeydew, watermelon, muskmelon, sugar baby, etc.), lettuce, beets, carrots, bell pepper, sunflowers, and fruit trees (apple, peach, apricot), among other things.

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[23] 2012 Census of Agriculture, USDA, National Agricultural Statistics Service, "American Indian Reservations" (Table 1) at 43.
[24] Id. at 69 (13,955 of our farms are family or individual owned; 407 of our farms are owned by partnerships, corporations, cooperatives, estates, or trusts, etc.).
[25] Id. at 147 (15,921 of our farmers list farming as their primary occupation; 6,948 list "Other" as their primary occupation).
[26] Id. at 147 (18,923 of our farmers have been working on their present farm for 10 years or more; 3,946, or 21 percent, have been working on their farms for less than 10 years).
[27] Id. at 69, 95.
[28] To get a more complete snapshot of impacts to our farmers and ranchers along the San Juan River, the Nation has a 10-day assessment of crop and livestock underway.
[29] http://navajobusiness.com/fastFacts/Overview.htm
[30] http://www.atsdr.cdc.gov/csem/lead/docs/lead_patient-education.pdf at 1.
[31] http://www.atsdr.cdc.gov/csem/lead/docs/lead_patient-education.pdf at 1.
[32] *Id.*
[33] *Id.*
[34] http://www.atsdr.cdc.gov/toxfaqs/tfacts2.pdf at 1.
[35] *Id.*
[36] *Id.*

Dr. Donald Benn Biography

Dr. Benn is of the Black Streak of the Wood People and born to the Mountain Cove. He is originally from Pinedale, NM, but grew up farming and ranching in Lukachukai, AZ. He was taught basic foundations and lifeways by his grandfather, applied this knowledge to his own life and is teaching it to next generations. He attended boarding schools on the Navajo Reservation, graduated from Shiprock High school in Shiprock, NM and received a PhD in chemistry from New Mexico State University in Las Cruces, NM.

Chairman SMITH. Thank you, Dr. Benn.
And Mayor Brookie.

TESTIMONY OF THE HON. DEAN BROOKIE, MAYOR, DURANGO, COLORADO

Hon. BROOKIE. Thank you, Chairman Smith, Ranking Member Johnson, and honorable Members of the Committee for the opportunity to testify today. I am Dean Brookie, Mayor of Durango, Colorado, a city of 18,000 residents at the base of the San Juan Mountains along the Animas River.

I have lived, worked and recreated in these mountains since 1980. Since its founding, our community has depended on the virtues of the natural environment as its lifeblood. Our mining heritage is important, but our current economy is not dependent on mining, rather, our mining history, outdoor recreation, the arts, other natural and cultural amenities.

The August 5th mine waste release into the Animas River put a technicolor spotlight on the massive and complex century-old problem that our communities have lacked the resources to address. The fact is that three million gallons of acid mine water were released out of the Gold King Mine that day. However, this is not just a one-time incident. About three million gallons of mine water drain out of the Gold King each week prior to and subsequent to this event. That is the quiet but real catastrophe that has largely gone unnoticed by the public until now.

Our rivers are what bind us together as communities. The veins of the Animas River flow into other aquatic arteries of the West including the San Juan River, which flows through the Ute Mountain and the Navajo reservations before reaching Lake Powell. From there it joins the Colorado that flows to the Grand Canyon into Lake Meade, a water source for Phoenix, Las Vegas, Los Angeles and San Diego.

It is tempting in times of crisis to point fingers and place blame. After 130 years, thousands of mines, millions of individual actors, and literally billions of gallons of polluted water, attempts to blame single agencies or individuals ignore the scale and complexity of the problem that needs to be addressed.

We must continue to work together at the local, state and federal level and do much more quickly and with greater resolve to comprehensively address the water quality threats to our region before they result in far greater harm to our communities as well as additional costs to government.

The EPA must be held accountable for this accident. Every indication we have received from them shows that they are taking this incident seriously. There is no denying they hands on the shovel, but the EPA was at the Gold King Mine trying to help address these longstanding environmental issues. In fact, the blowout could have happened naturally the day before or any day in the future.

Without the EPA, the federal government more broadly—and the federal government more broadly, there is simply no option for addressing the risk to human health and environment caused by the region's mining legacy. Yes, we can and should hold responsible parties in the mining industry accountable as well. Local, state,

tribal governments, not-for-profits, and businesses also have a role to play.

Fundamentally, though, our community needs the scientific, technological and financial leadership of the EPA to guide a collaborative process for addressing the broader problem. I see before us a watershed moment: to turn a new chapter in mining history and protect our watersheds from Silverton to San Diego.

I hope that the Committee will join us to achieve a comprehensive, science-based solution and will help to ensure that the EPA and other federal agencies have the resources and the clear direction needed to ensure the Gold King release is the last time we need to be reminded of this long-term problem before taking action.

The City of Durango welcomes the Committee's help to address risks and vulnerabilities posed by water pollution in the Animas River including supporting the request of the EPA for over $50 million to build a new water treatment plant at Lake Nighthorse and create an important redundancy to our city's water supply. Responding to this event, a bipartisan coalition of four U.S. Senators and two Congressmen has asked the Administration to look at funding of a water treatment plant in Silverton as well.

I encourage Congress to look at reforming the 1872 mining law that takes us from the 19th century into the 21st century and consider a royalty on mining companies, the same royalties currently paid by all other extractive industries that would be used for cleanup.

Lastly, the Good Samaritan legislation proposed by Congressmen Tipton, Bennett and Udall during the last Congress could be an additional tool used towards long-term solutions for cleaning up abandoned mines at less cost to government.

With support from the EPA and Congress, I'm certain that we have the capacity to work together to develop an efficient, equitable and scientifically sound approach to ensure the legacy that we leave our children is not one of accusation and rancor, but one of collaborative deliberation and action. Inaction will only allow this contamination to continue and result in continued impacts to our rivers, community and all taxpayers.

Please see my written testimony for more detailed information of the historical context about the environmental impact of mining in the San Juan Mountains, cleanup, and the timelines of notification and follow-up activities by the EPA.

Thank you for your time. I look forward to your questions.

[The prepared statement of Hon. Brookie follows:]

Testimony by Mayor Dean Brookie, City of Durango, Colorado, Regarding "Holding the EPA Accountable for Polluting Western Waters", Committee on Science, Space & Technology, September 9, 2015

Summary

I am Dean Brookie, Mayor of Durango, Colorado, a city of 18,000 residents at the base of the San Juan Mountains along the Animas River. I have lived, worked, and recreated in these mountains since 1980. Since our founding, our community has been dependent on the virtues of the natural environment as its lifeblood. Our mining heritage is important, but our current economy is not depending upon mining, rather our mining history, outdoor recreation, the arts, and other natural and cultural amenities.

The August 5th mine waste release into the Animas River put a Technicolor spotlight on a massive and complex century-old problem that our communities have lacked the resources to address. The fact is that 3 million gallons of mine water were released out of the Gold King mine that day; however, this is not just a one-time incident. According to the EPA' Internal Review of the August 5, 2015 Gold King Mine Blowout about 3 million gallons of mine water drain out of the Gold King each week, and four mines in immediate vicinity drain 330 million gallons per year into Cement Creek, the Animas River, the San Juan River and eventually, the Colorado River. A review of Durango's newspaper archives reveals a long story of mine waste discharges dating to 1899 or before. That is the quiet but real catastrophe that has largely gone un-noticed by the public until now.

It is tempting in times of crisis to point fingers and place blame. Over 130 years, thousands of mines, millions of individual actors, and literally billions of gallons of polluted water that have run through our community – attempts to blame single agencies or individuals are pointless, and ignore the scale and complexity of the problem that needs to be addressed. We must continue to work together at the local, state and federal level – and do so much more, quickly and with greater resolve – to comprehensively address the water quality threats to our region before they result in far greater harm to our communities, as well as additional costs to government.

The EPA must be held accountable for this accident. Every indication we have received from them shows that they are taking the incident seriously. There is no denying they had their 'hand on the shovel' during this incident, but they did not cause this spill on purpose. The EPA was at the Gold King mine helping to address these long standing environmental issues. Without the EPA and the federal government more broadly, there is simply no option for addressing the risk to human health and the environment caused by the region's mining legacy. Yes, we can and should hold responsible parties in the mining industry responsible. Local, and state governments, not-for-profits, and businesses all also have a role to play. Fundamentally though, our community needs the scientific, technological and financial leadership of the EPA to guide a collaborative process for addressing this problem.

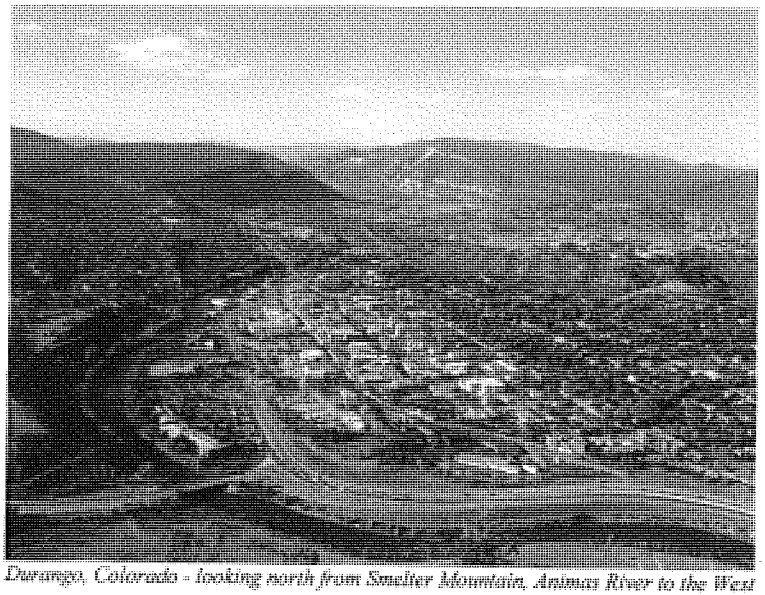
I hope that the Committee will join with us in supporting a comprehensive science-based solution to this problem, and will help ensure that the EPA and other Federal Agencies have the resources and the clear direction needed to ensure that the Gold King release is the last time we need to be reminded of this long-term problem before taking action. The City of Durango welcomes the Committee's support and commitment to helping to address the risks and vulnerabilities posed by water pollution in the Animas River, including supporting our request to the EPA for over $50 million dollars to build a new water treatment plant at Lake Nighthorse and create an important redundancy to our City's water supply. Additionally, I would urge Congress to look favorably upon a future proposal to fund a water treatment facility at the source. Responding to this event, a bipartisan coalition of four US Senators and two Congressman has asked the administration to look at funding a water treatment plant in Silverton. I also encourage Congress to look at reforming the 1872 mining law to take us from the 19th into the 21st century and consider some kind of royalty on mining companies (the same royalties currently paid by all other extractive industries) that we could tap into to pay for clean up. Lastly, the bi-partisan Congressmen Udall, Tipton, and Bennet Good Samaritan legislation from the last Congress could be an additional tool used towards a long-term solution for cleaning up abandoned mines.

With support from EPA and Congress, I am certain we have the capacity to work together to develop an efficient, equitable and scientifically sound approach to ensure the legacy we leave to our children is not one of accusation and rancor, but one built of collaborative deliberation and action. Inaction by Congress will only allow this contamination to continue and result in continued impacts to our rivers, communities, and all taxpayers.

Testimony by
Mayor Dean Brookie, City of Durango, Colorado
Regarding
"Holding the EPA Accountable for Polluting Western Waters"
Committee on Science, Space & Technology
September 9, 2015

Thank you Chairman Smith, Ranking Member Johnson and honorable members of the Committee for the opportunity to testify today.

I am the Mayor of Durango, Colorado, a city of 18,000 residents at the base of the San Juan Mountains along the Animas River. I have lived, worked, and recreated in these mountains since 1980. Since our founding, our community has been dependent on the virtues of the natural environment as its lifeblood. Durango, like other cities of our region, was founded as a mining town and celebrates this rich history each and every day. Millions of tourists now visit our community, in part due to the natural beauty and unparalleled recreation opportunities, but equally to experience and learn about our history and to sneak a glimpse into the past – whether it is through visits to Ancestral Puebloan sites at Mesa Verde National Park, to ride the Durango-Silverton Narrow Gauge Railroad, or explore mining relics in the steep and unforgiving San Juan Mountains.



Durango, Colorado - looking north from Smelter Mountain, Animas River to the West

The Ongoing Environmental Impact of Mining

The August 5th mine waste release into the Animas River put a Technicolor spotlight on a massive and complex century-old problem that our communities have lacked the resources to address.

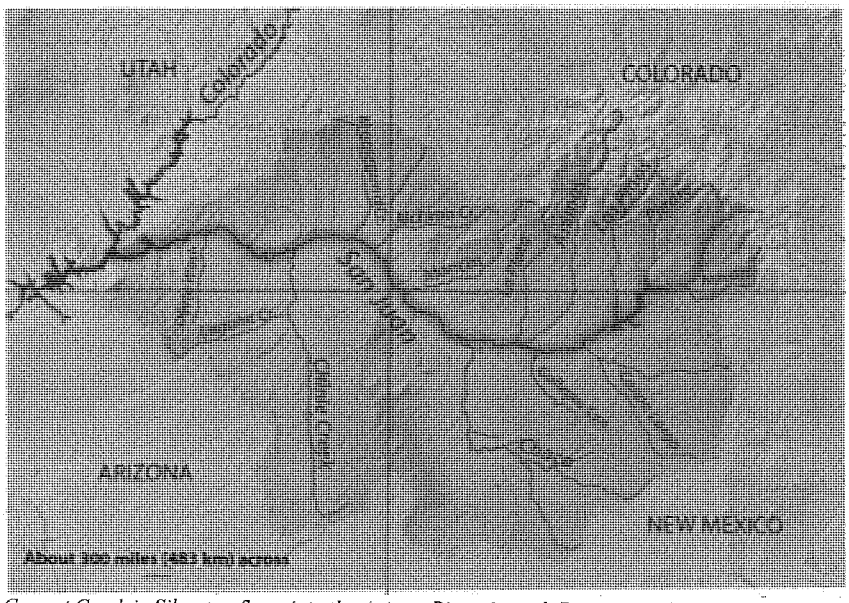
The fact is that 3 million gallons of mine water were released out of the Gold King mine that day; however, this is not just a one-time incident. According to the EPA's Internal Review of the August 5, 2015 Gold King Mine Blowout about 3 million gallons of mine water drain out of the Gold King each week, and four mines in immediate vicinity drain 6.3 million gallons per week (330 million gallons per year) into Cement Creek, the Animas River, the San Juan River and eventually, the Colorado River. That is the quiet but real catastrophe that has largely gone un-noticed by the public until now.

Even less noticeable to most casual observers of the Animas has been the persistent and diffuse drainage of the draining mines that speckle the watershed. The Gold King, for example, was draining anywhere from 200 to 500 gallons per minute prior to the blowout. Thus the August 5th release of 3 million gallons was equivalent to roughly a week's worth of "normal" discharge from just this mine (2% of the annual discharge). Other sites contribute even greater volumes and more concentrated pollution.

Silverton, Colorado - Looking north, Cement Creek flowing under the clouds into the Animas River, bottom right corner.

The veins of the Animas River flow into other aquatic arteries of the West – the San Juan River, and the Colorado River. The San Juan is so important that adjacent counties in Colorado, Utah, and New Mexico are named for it. Our rivers are what bind us together as communities. Throughout the Southwest, we are all a part of the Animas River Watershed. The San Juan River flows through the Ute Mountain and Navajo Reservations before reaching Lake Powell. From there it joins the Colorado River that flows through the Grand Canyon into Lake Mead, a water source for Phoenix, Las Vegas, Los Angeles and San Diego.

While the national and international media spotlight lasted only one week, the heavy metal contamination that emanates from hundreds of separate mine sites in the mountains upstream of Durango has been impacting our community since the late 19th Century. It is a constant – if often invisible – threat to our community's public health and economic well-being, and has thus far resisted thoughtful and well-intended efforts to mitigate this risk.



Cement Creek in Silverton flows into the Animas River through Durango and into the San Juan River and, eventually, the Colorado River.

It is tempting in times of crisis to point fingers and place blame. Over 130 years, thousands of mines, millions of individual actors, and literally billions of gallons of polluted water – attempts to blame single agencies or individuals are pointless, and ignore the scale and complexity of the problem that needs to be addressed. We must continue to work together at the local, state and federal level – and do so much more quickly and with greater resolve – to comprehensively address the water quality threats to our region before they result in far greater harm to our communities, as well as additional costs to government.

The Gold King release is the latest in a long legacy of specific events that have raised awareness about threats posed by historic mining in the San Juan Mountains. Fortunately, thanks to the efforts of many individuals and organizations from the federal, state, and local levels our community came together to respond to this disaster in a truly admirable way. While our initial response was focused on understanding and eliminating the risks of the increased pollution coming from the Gold King release on public health, the environment and our economy, we have quickly progressed to focus on the need for long-term solutions built on scientific information and a robust collaboration amongst the region's diverse communities up and down the watershed.

History of Minerals, Mining and Impacts in the San Juan Mountains

Miners first came to the San Juan Mountains around 1870 due to a long list of valuable minerals that are found in them. The Upper Animas River follows the edge of the collapsed crater of an ancient volcano—called a caldera—that was naturally enriched by mineral-laden water which followed the faults of the crater and deposited metals, such as gold, silver, lead, zinc and copper along the fissures in the mountains. Our beloved Red Mountain is red because of the naturally high levels of iron oxides and other minerals deposited about 27 million years ago.

Water follows these same faults, as natural cracks and fissures, eventually emerging as fresh water springs or combining with groundwater. These tight cracks in the mountain are usually free of oxygen.

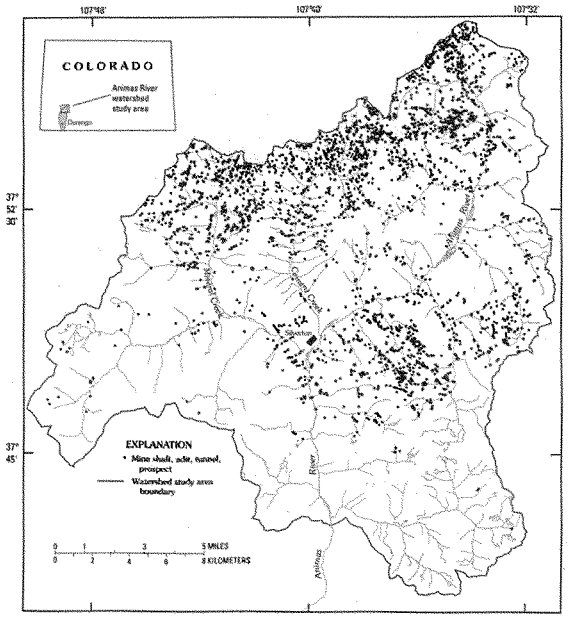


Figure 1. Locations of 5,397 mine shafts, adits, tunnels, and prospects from U.S. Geological Survey 1:24,000 scale topographic maps (Handies Peak, 1955; Howardsville, 1955; Ironton, 1955; Ophir, 1955; Silverton, 1955) and 373 AMLI_MINE_ID locations in Animas River watershed study area.

Source: USGS Professional Paper, USGS, Vol 1 Chapter E5 Environmental Effects of Historical Mining, Animas River Watershed, Colorado p. 260. "Acid mine drainage from historical mines represents a long-term source of contamination that affects water quality in the Animas River." In all, there are over 5000 mine shafts, adits, tunnels, and prospects in the Upper Animas drainage, of which at least 110 have been identified as draining water just like the Gold King. Mining creates shafts and tunnels to access the mineralized veins in the mountains- the same faults as originally followed by groundwater. With the addition of the mine, the water follows the path of least resistance – the new tunnels. The tunnels also provide a pathway for oxygen to enter, changing the nature of the chemical reactions occurring within the mountains.

When water and oxygen mix with pyrite, a chain reaction occurs resulting in sulfuric acid, also known as acid mine drainage, which causes the water draining from the mine to have a pH level between 2 (lemon juice) and 5 (black coffee). The acidic water running through the mine dissolves more metals into the solution, such as zinc, cadmium, silver, copper, manganese, lead, aluminum and arsenic.

As acidic water exits a mountain (often via a mine portal) it may drain through even more metal-rich waste rock piled outside, picking up more metals before eventually reaching a stream. The result is concentrated slurry called ("acid mine drainage") that is laden with heavy metals and highly acidic.

This chemical process occurs naturally, and some streams in the San Juan Mountains were acidic and did not support aquatic life even before mining began. With the initiation of mining in the 1880s in the Animas River drainage, the impacts became widespread almost immediately.

Historical Context of the Environmental Impact of Animas River Mining Pollution

The environmental impact of mining is not a new phenomenon to our community. *"The question that is crowding upon Durango thick and fast is one of water. The mill slimes from Silverton are now reaching us."* This statement appeared in the Durango newspaper, not in August 2015, but in 1899, a testament to the long history of mining-related pollution in the Animas River. A review of Durango's newspaper archives reveals a long story of mine waste discharges dating to 1899 or before. At this time, most mine tailings and wastewater drained directly into the river, and thus were an ever-present danger.

Indeed, as the putrid orange plume of acidic, heavy-metal laden water and silt made its way down the Animas River toward Durango on August 5 and 6 of this year, the City of Durango, like other river users up and down stream, shut off its Animas River water intakes. Even so, by instituting immediate voluntary water conservation measures, Durango was able to manage resulting potable water shortages. That's because in 1902, the town fathers switched the main drinking water source away from the abundant Animas, which runs right through town, in favor of the Florida River, which carries less water and is separated from the city by a series of ridges.

The town made this decision because the Animas River at the time was deeply polluted by mining activities some 50 miles upstream and as a result, it ran "gray and turbid" all summer long. From the beginning of heavy mining activity in the Silverton Caldera in the 1870s, the miners acted with little regard either for the environment or the folks living downstream. Their mines exposed water and metals to oxygen, thus setting up the chemical reaction that creates acid mine drainage, or heavy metal-loaded, acidic water that is toxic to aquatic life and, in high enough concentrations, to humans. Nearly every mine adit discharges this tainted water, and it was acid mine drainage that came spewing out of the Gold King on the morning of Aug. 5.

In addition, for the first six decades of mining activity in the Silverton region, the miners simply dumped their waste right into the streams. During the early days, for example, the Greene & Co. Smelter sat along the banks of Cement Creek. It emitted acid- and metal-bearing flue dusts directly into the air, and its operators didn't think twice about letting mercury, used to recover gold, leak out onto the ground or into the stream. Tailings, a toxic sludge leftover from milling ore, was dumped directly into floodplains or streams, polluting and turning the river a terrible color for more than 100 miles downstream. Miners haphazardly dumped an estimated 8 to 9 million tons of tailings before, in the 1930s, downstream farmers finally pressured them to stop, because the silt was clogging their ditches.

Still, the pollution continued. Over one hundred mines, including the Gold King, continued to discharge acid mine drainage, without any hint of mitigation. And poorly constructed tailings piles continued to fail. In the 1960s, the state went after Standard Metals because its mill was leaking cyanide into the Animas, and probably had been for months or even years, unnoticed. By the 1970s, the Colorado Division of Wildlife declared the upper reaches of the Animas "essentially dead" as a result, and devoid of any fish.

In 1975, the Standard Metals tailings dam just northeast of Silverton was breached, sending some 50,000 tons of tailings into the Animas, turning the entire reach of the river the "color of aluminum paint" as one observer put it. Of the dozens of fish in cages deposited in the river in Durango, only four survived. Just three years later, almost to the day, the workings of the Sunnyside Mine got too close to the bottom of an alpine lake. The lake's bottom blew out into the mine, sending tens of millions of gallons of water through the mine, carrying thousands of tons of sludge, tailings, and equipment with it, all of which shot out of the tunnel directly into Cement Creek. This time the Animas River turned black all the way to Farmington. These were just the catastrophic spills. It wasn't at all uncommon for tailings to discharge into the river during big thunderstorms or snow melt.

Over the past two decades, a great deal of cleanup has occurred: Tailings have been scraped out of flood plains and consolidated in huge piles and capped; draining mine adits have been plugged, or water diverted around metal-loaded waste piles; in some cases, water was diverted before it could get in the mine and become tainted. But the pollution has continued. Since 2005, the Gold King Mine had been discharging between 200-500 gallons per minute of acid mine drainage. It only slowed over the past year or so because roof collapses had impounded the water in the mine. Other nearby mines discharge tainted water at similar rates. And blowouts like the one at the Gold King are hardly uncommon: In spring of 2014, the Bagley Tunnel near Animas Forks blew out on its own (it did the same in the 1990s). The sediment in the river as a result of spring runoff obscured the plume. One time Bill Simon of the Animas River Stakeholders Group was working on a mine when it blew out and wrecked his backhoe.

Summary of Historical Points:

1. Since at least the 1880s, downstream users have grappled with mining-related pollution on the Animas, both as a result of acid mine drainage and because the mines dumped tailings directly into the river.
2. By the 1890s, the Animas River through Durango ran "grey and turbid" nearly every day thanks to mill tailings being dumped into the river near Silverton
3. In 1902, Durango shifted its primary water source from the Animas to the Florida River because of the tailings.
4. Farmers in the Animas Valley took legal action against the mines because the tailings were clogging their ditches; they finally succeeded in the 1930s in getting the mines to contain their tailings.
5. In 1975, a huge tailings pond dam busted, sending 50,000 tons of tailings into the Animas, turning it the color of "aluminum paint" down to Farmington.
6. In 1978, Lake Emma burst into the Sunnyside mine, sending tens of millions of gallons of water and sludge down the river. This time the Animas was black all the way to Farmington.
7. Mine blowouts like that at the Gold King are not uncommon. One happened in a mine near Animas Forks in spring 2014 — it wasn't noticed downstream because it was during runoff, when the river's turbid and brown, anyway.
8. The Gold King was draining anywhere from 200 to 500 gallons per minute prior to the blowout prior to the roof collapse that impounded those 3 million gallons of water in the mine), and will continue to do so. Those 3 million gallons and much more would have reached the Animas at some point anyway, either by a blowout, or slowly through daily discharge.

History of Efforts towards Cleanup: Investigation and Actions in the Upper Animas

While we have lacked the resources to deal with this issue, we have not lacked resolve. There has been a dedicated collective of agencies, mine owners, individual citizens, and nonprofit partners that over the past two decades have initiated a great deal of cleanup. But the pollution has continued.

Starting in the 1990s, the Colorado Water Quality Control Division (WQCD) and EPA began to investigate the water quality in the Animas basin to inform water quality standards for the basin. The investigation determined severe impacts to aquatic life in the Upper Animas and its tributaries from naturally occurring and mining-related heavy metals. The two agencies also acknowledged that a community-based effort, the Animas River Stakeholders Group, had formed to address reclamation. The EPA agreed at that time to postpone adding all or a portion of the watershed to the Superfund National Priorities List (NPL) as long as progress was made to improve the water quality. Since then, the EPA has been a partner to the collaborative efforts contributing resources for sampling, risk assessments, and data analysis. Additionally, EPA has supported cleanup efforts through grants to the collaborative and the state agencies.

Also in 1991, the last big mine in the region, Sunnyside Gold Corporation, closed and undertook a series of actions to reduce pollution including plugging its own mine and installing a water treatment facility for several draining mines in Cement Creek (near the Gold King). The treatment plant was to treat Cement Creek until theirs and others' extensive efforts demonstrated the potential for action to reap results. By the early 2000s, zinc, cadmium and lead levels in Mineral Creek had dropped by 50 to 75 percent, and water quality in the Upper Animas had improved significantly. Fish appeared just below Silverton, where they hadn't been seen in probably a century.

The Gold King, Red & Bonita, and Mogul mines began draining more water directly into Cement Creek and the headwaters of the Animas. The source of the additional water is attributed by some (in whole or in part) to the bulkheads that Sunnyside had installed in its nearby mine following its closure.

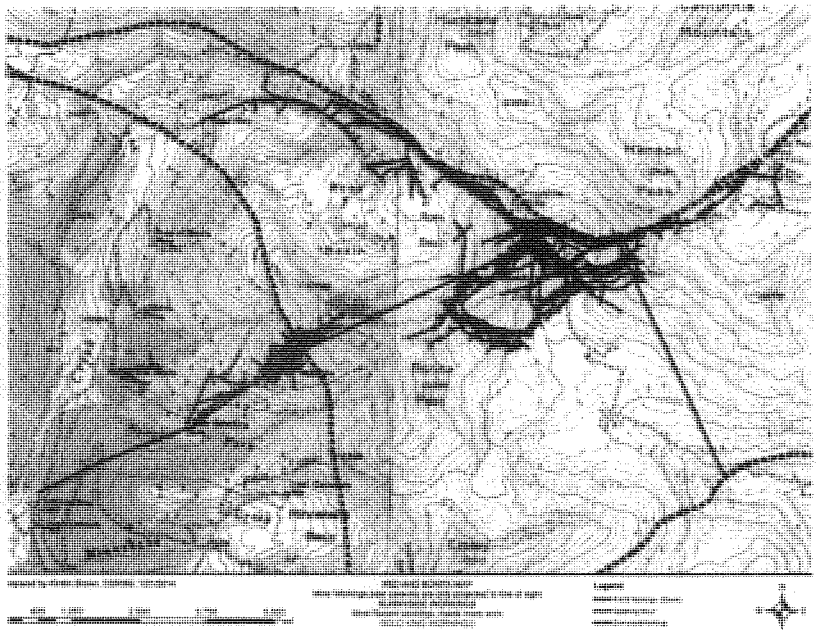
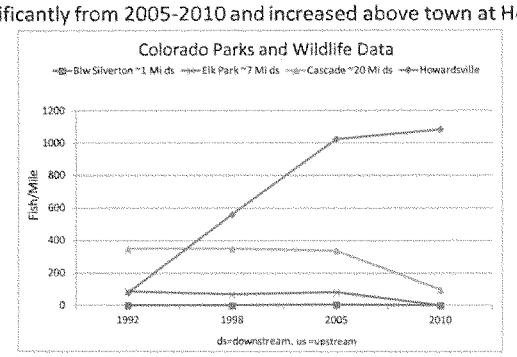


Figure: Location of Gold King Mine, Red and Bonita Mine, American Tunnel and Sunnyside Mine Works.Source: US EPA Action Memorandum for Red and Bonita Removal Action, September 24, 2014

Additionally, the treatment plant was transferred to another owner who unfortunately ran into technical, financial and legal troubles. The treatment plant stopped operating around 2004. By 2010 water quality for miles downstream once again deteriorated. The fish that had returned to the Animas below Silverton were lost.

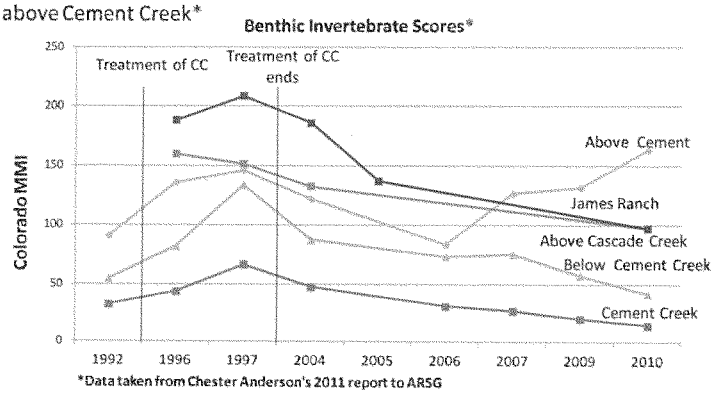
Brook trout populations in the Animas River canyon have declined significantly from 2005-2010 and increased above town at Howardsville.*



*Colorado Parks and Wildlife, 2010 Animas River Report

Results to date indicate benthic communities are impaired

3. Aquatic insect communities have declined significantly in all Animas River locations below Cement Creek since water treatment ceased. This pattern is not observed above Cement Creek*



In 2013 in combination with other local and state stakeholders, EPA conducted initial assessment work to better understand the causes of the increasing pollution and identify next steps for the improving Cement Creek, including evaluating the Red & Bonita, Gold King and other sources of pollution.

The August 5th Gold King Release, Response and Impact

The Colorado Department of Public Health & the Environment (CDPHE) notified the City of Durango of the Gold King release at 1:39 pm on Wednesday, August 5th, 2015. Our City immediately responded by halting intake of water from the Animas River to ensure protection of our community's drinking water. La Plata County Sheriff also closed public access to the Animas River the afternoon of Thursday, August 6th to protect human health, resulting ultimately in closing businesses and keeping residents and tourists away from the river. The river remained closed for 9 days until the Sheriff re-opened it at noon on Friday, August 16th.

Durango suffered a swift negative impact on the environment and the economy, particularly business tied to tourism. Durango's eight rafting businesses, which thrive in the summer months, took the biggest hit with the river closed for eight days during peak season. Mild to Wild, a rafting company 22 years in operation, typically peaks at 85 employees during the season, with 50 people of those jobs tied directly to the Animas River. 30 people stopped working because of the spill, and the company had to lay off seasonal employees 2-3 weeks early. Four Corners Whitewater had to give back $15,000 in refunds to customers during the vital end-of-season weeks. Early estimates show hundreds of thousands of dollars in direct trip loss. Rafting companies were serving 500-600 customers each day prior to the accident. Based on historical averages, tourist travel slowed significantly and jeep and other excursion tours were hurt too. Recent events continue to serve as a reminder of how strong our ties to our past continue to be. Our mining heritage is important, but our current economy is not dependent upon mining, rather our mining history, outdoor recreation, the arts, and other natural and cultural amenities.

The City of Durango incurred approximately $270,000 in direct costs related to the mine spill mostly in staff time. La Plata County spent $178,000 post spill. August sales and lodger tax receipts are not yet available to compare to prior years, however County sales tax provides revenue to the towns of Bayfield and Ignacio and may result in an impact to these neighboring towns as well.

The biggest impact we are worried about is the future, the stigma damage of the media coverage and images that can ruin the reputation of a beautiful town and a mountain stream. The constant media coverage was the equivalent of a multi-million dollar advertising campaign to tell people it's not safe to visit Durango. CNN ran a headline 'Durango is closed for the season' and Conan O'Brien ran a 3-minute video titled 'The Animas River is trying to kill you'. One family submitted a letter to the editor in the Durango Herald that said they had planned to purchase a home in Durango, but because of the mine spill was no longer interested. Local realtors reported numerous aborted closings due to buyers concerns related to property values.

The Path Forward and Focusing on Solutions

I hope that the Committee will join with us in supporting a comprehensive science-based solution to this problem, and will help ensure that the EPA and other Federal Agencies have the resources and the clear direction needed to ensure that the Gold King release is the last time we need to be reminded of this long-term problem before taking action.

The events of August 5th remind us of the constant risks we face, and the significant challenges we must overcome to reduce the risk to human health, the environment and our economic

security. Similar, or far more tragic releases could happen at any time from any of these draining mines without warning and without any witness or cause. We do not want to be considered victims. We want to empower our community to be responsible for the resources we use and manage. We consider ourselves fortunate that the impacts of this particular event were relatively short in duration and the risks associated appear to have been within our collective abilities to mitigate. We should not take this for granted. We need to learn from this event, share our experience with other extractive industry-impacted communities, and take action to reduce the likelihood that something similar happens again, for our own and future generations.

Durango and our neighbors throughout the Animas River watershed are seeking to resolve an environmental problem that is three times as old as the Environmental Protection Agency itself. Few parties remain who had a hand in causing this situation, but we all have a role in making sure it is addressed. It is a technological problem, a legal problem and most of all, a problem of limited resources. The only proven solution to dealing with acid mine drainage is to treat the water that drains out of the mines. Evidence from the Animas River and from dozens of other sites demonstrates that it can be done effectively, but it is costly, and requires investment indefinitely.

The EPA must be held accountable for this accident. Every indication we have received from them shows that they are taking the incident seriously. There is no denying they had their hand on the shovel during this incident, but they did not cause this spill on purpose. The EPA was at the Gold King mine helping to address these long standing environmental issues. Without the EPA and the federal government more broadly, there is simply no option for addressing the risk to human health and the environment caused by the region's mining legacy. Yes, we can and should hold responsible parties in the mining industry responsible. Local, and state governments, not-for-profits, and businesses all also have a role to play. Fundamentally though, our community needs the scientific, technological and financial leadership of the EPA to guide a collaborative process for addressing this problem.

EPA began a detailed assessment process in 2013 and must continue – and accelerate – their effort with other stakeholders to characterize the full scope of the problem and assess a full range of options for mitigation. While that assessment is being completed, the City of Durango and other stakeholders agree that water treatment facilities can and should be constructed to treat wastewater from the most polluting mines including the Gold King. Over the long-term, other strategies alongside water treatment will need to be identified and implemented. Still other barriers to action may need to be addressed by Congress.

The City of Durango welcomes the Committee's support and commitment to helping to address the risks and vulnerabilities posed by water pollution in the Animas River, including supporting our request to the EPA for over $50 million dollars to build a new water treatment plant at Lake Nighthorse and create an important redundancy to our City's water supply. Additionally, I would urge Congress to look favorably upon a future proposal to fund a water treatment facility at the source. Responding to this event, a bipartisan coalition of four US Senators and two Congressman has asked the administration to look at funding a water treatment plant in Silverton. I also encourage Congress to look at reforming the 1872 mining law to take us from the 19th into the 21st century and consider some kind of royalty on mining companies (the same royalties currently paid by all other extractive industries) that we could tap into to pay for clean up. Lastly, the bi-partisan Congressmen Udall, Tipton, and Bennet Good Samaritan legislation

from the last Congress could be an additional tool used towards a long-term solution for cleaning up abandoned mines.

The Gold King release has invigorated the kind of collaboration that will be required in a sustained manner over many years to address a problem of the scope and complexity that we face. EPA's continued leadership is essential to develop a science-based strategy for addressing the root causes of the water pollution problems in the Animas River watershed, and should not be undercut or frankly distracted by unfounded claims that they are somehow to blame for century-old problems. With support from EPA and Congress, I am certain we have the capacity to work together to develop an efficient, equitable and scientifically sound approach to ensure the legacy we leave to our children is not one of accusation and rancor, but one built of collaborative deliberation and action. Inaction by Congress will only allow this contamination to continue and result in continued impacts to our rivers, communities, and all taxpayers.

Resources

Animas River Stakeholders Group website and documents:

- Division of Wildlife's 2010 Animas River Report. Table 5 on Page 15 and Table 6 on Page 16 give a pretty clear look at the drastic change in fish population below Silverton between 2005-2010. Water quality deteriorated, almost certainly because water treatment at the American Tunnel and upper Cement Creek stopped (During Sunnyside's reclamation period, from about 1997 until 2002, its water treatment plant not only treated water coming from the American Tunnel, but also water in upper Cement Creek. After Sunnyside left, it turned over the water treatment plant to Steve Fearn, whose mining venture went bankrupt by 2004, so treatment stopped).
- Graphs that show the dramatic difference water treatment makes. http://www.animasriverstakeholdersgroup.org/attachments/File/EPA%20Assessment%20Status%20and%20Results%202014.pdf
- Bagley Mine Blowout referenced in ARSG meeting minutes from July 22, 2014

High Country News

- Why Silverton Still Doesn't Want a Superfund Site. By Krista Langlois, September 3, 2015 (web exclusive)
- Gold King Mine Water Was Headed for the Animas Anyway: The Nuts and Bolts of Acid Mine Drainage, By Jonathan Thompson, August 28, 2015
- Five Western waterways worse than the orange Animas, Colorado's Animas River has gotten the most attention – but it's hardly alone, By Krista Langlois, August 24, 2015 (web exclusive)
- Animas dispatch: Hundreds celebrate the river's reopening, Durango may be moving on, but wider fears about the toxic spill still reverberate. By Krista Langlois, August 19, 2015
- Animas River spill: only the latest in 150 years of pollution, Mapping the other threats to the Animas and San Juan Rivers. By Jonathan Thompson, August 17, 2015
- When Our River Turned Orange, By Jonathan Thompson, August 9, 2015
- A Radical Approach to Mine Reclamation, By Ray Ring, January 19, 1998

New York Times

- When a River Runs Orange, by Gwen Lachelt, August 20, 2015

Orion Magazine/Blog/Letters from the Field

- Letter from Colorado: On the Dirty, Deep-seated Origins of the Animas River Spill, By Jeff Snowbarger, August 2015

Professional Papers

- Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado
  Edited by Stanley E. Church, Paul von Guerard, and Susan E. Finger - Historical pollution Chapter C and D. - http://pubs.usgs.gov/pp/1651/
- http://co.water.usgs.gov/projects/index_md.html
- Multi-Discipline Projects in Colorado

The USGS Colorado Water Science Center conducts hydrologic projects that address a wide variety of water-resources issues, including water supply, ground-water contamination, nutrient loading in streams, effects of land use on water quality, and basic hydrologic data collection. This page lists the multi-discipline projects currently underway.

Abandoned-Mine-Land Initiative · Effects of mining · Alpine/subalpine watersheds · Irrigation · Modeling · Multi-Discipline

Abandoned-Mine-Land Initiative

- Upper Animas River Basin Abandoned Mine Lands Initiative

Effects of mining

- Relationship of Turquoise Lake Levels to Mine Tunnel Flow in the Sugarloaf Mining District 2003-2005
- Watershed Contamination from Hard Rock Mining
- Sources of Metal Loading to the Lake Fork from Turquoise Lake to the confluence with the Arkansas River

Alpine/subalpine watersheds

- Effects of Energy Production Emissions on Colorado Lakes
- Water, Energy, and Biogeochemical budgets in alpine/subalpine watersheds
- Amphibian Research and Monitoring Initiative: Rocky Mountain region
- Water-Quality Sampling at Five Hydrologic Benchmark Stations in the Western United States
- Rocky Mountain Regional Snowpack Chemistry Monitoring Study Area: High-elevation sites near the Continental Divide in Montana, Wyoming, Idaho, Colorado, New Mexico, and Utah
- Snowpack Sublimation: Measurements and Modeling in the Colorado River Basin

Irrigation

- Measurements of Irrigation Canal Seepage Losses Below Trinidad Dam, Las Animas County, Colorado, 2000-2003

Modeling

- Simulated Effects of Proposed Southern Delivery System Alternatives on Hydrodynamics and Water Quality of Pueblo Reservoir Using a Two-Dimensional Hydrodynamic and Water-Quality Model, Pueblo, Colorado
- One-Dimensional Transport with Inflow and Storage (OTIS): A Solute Transport Model for Streams and Rivers
- MODFLOW/MODFLOWP Integration
- Modifications to the Fountain Creek transit-loss accounting program to account for Fryingpan-Arkansas water return flows
- Development of methods to determine transit losses for return flows of imported water in Monument and Fountain Creeks, and revision of an existing transit-loss accounting program for Fountain Creek, El Paso and Pueblo Counties, Colorado

Multi-Discipline

- Biosolids, soils, crops, ground water, and streambed sediments in the vicinity of a biosolids-application area near Deer Trail, Colorado

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Dean Brookie

Christina Rinderle

Keith Brant

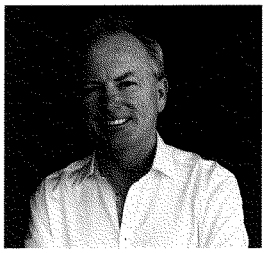
Dick White

Sweetie Marbury

Code of Ethics / Code of Conduct

Proclamation / Citizen Recognition Request

Dean Brookie, Mayor/City Councilor



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Email Dean
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Dean Brookie established his architecture and planning firm based in Durango in 1980. He has dedicated much of his career to developing affordable housing, municipal and educational facilities, and historic preservation in historic downtowns nationwide.

He has served on the city's Board of Appeals and on numerous not-for-profit boards including High Noon Rotary Club, Habitat for Humanity, and the Durango Adult Education Center. He is a founding member of the Boys and Girls Club and a Council Member of the El Pomar Foundation.

In 2007, he was honored as Volunteer of the Year for Habitat for Humanity in Colorado for his design assistance for family housing, and in 2009 received Colorado's Governor's Award for Downtown Excellence for the Best Building Rehabilitation of the former Wallace Furniture Building, located at 858 Main Avenue.

A leader in community development and environmental sustainability, Dean was a principal member of the design teams for the Durango Community Recreation Center and award winning, LEED-certified Durango Multi-Modal Transit Center.

Dean completed a Bachelors of Environmental Design and a Master of Architecture at the University of Colorado – Boulder. Dean enjoys hiking, fly-fishing and percussion. He has three children residing in Washington, D.C. and Loveland, Colorado.

Chairman SMITH. Thank you, Mayor Brookie.
And Dr. Williamson.

TESTIMONY OF DR. MARK WILLIAMSON, GEOCHEMIST, GEOCHEMICAL SOLUTIONS LLC

Dr. WILLIAMSON. Good morning, Chairman Smith, Members of the Committee. I appreciate the opportunity to be here today and contribute what I may.

My name is Mark Williamson. I am a geochemist living in Loveland, Colorado, and I earned my Ph.D. from Virginia Tech in the Department of Geological Sciences. For the whole of my professional career and extending back into my graduate days, I have focused on the geochemistry of the acid rock drainage, the type of solution discharged from the Gold King Mine, its management, and the associated issues of metals in aquatic and terrestrial environments. Consistent with the language in my invitation to this hearing, I'm present to offer my education and experience to the Committee in this examination of the circumstances surrounding the discharge of acid rock drainage (ARD) from the Gold King Mine.

Like many of my fellow Coloradoans, other professionals that work with ARD, and citizens concerned with the quality of our water resources, I was disturbed by the discharge from the Gold King Mine. ARD has a significant impact on water resources negatively affecting thousands of miles of streams and rivers throughout the United States.

To control, but not necessarily eliminate the discharge of ARD from disused mines, the engineered plugging of mine openings to regulate the flow of ARD has been a simple, relatively effective management technique, but results in a refilling of the mine workings with water. At the Gold King Mine, work plans from 2014 and 2015 that I've been able to see indicate that such refilling was anticipated and that a potential blowout condition was deemed to exist at the collapsed Gold King Mine portal, prompting the need for action.

Despite the anticipated filling of the workings and the potential blowout condition, field operations at the Gold King Mine used excavation equipment to dig open the collapsed mine portal. It is not clear to me that any investigations were conducted to assess how much water was present behind the collapse, or if there was any water at all.

Given the uncertainty, the potential negative consequences, and with the benefit of hindsight, a detailed assessment of the situation would have been advisable but I am not aware of such documentation. Any number of lines of investigation are familiar to me that may have be pursued, including drilling a borehole behind the collapse feature, inspecting the mine area for developing seeps and springs, searching for exploration boreholes that extend into the workings, reviewing and inspecting older mine maps for potential other openings, or, as seems documented in work plans of 2015, inserting a pipe through the collapse feature to pierce it and check for the presence of water. Of these, a borehole behind the collapse and a pipe piercing the collapse can be used to pump out water, to the extent it is present, in a controlled manner to remove the water and its associated risk. It is not clear to me from materials

made public that any such investigation or evaluations were conducted. Without further documentation, it cannot be determined if site operations arbitrarily abandoned a conceptual site model or if actual conditions behind the dam led to a paradigm shift. Given the ultimate outcome at the site and the lack of specific documentation, it appears that appropriate risk-reducing evaluations may not have been conducted.

The resulting discharge of ARD from the Gold King Mine was comprised of an acidic metal-bearing solution as well as a metal-containing sludge. Both of these can and do result in negative effects on the quality of receiving streams. The solution phase can result in immediate acute impacts and the sludge acute impacts as well as more long term chronic conditions. Acute effects appear to have been temporal, largely avoided with the passing of the plume. The chronic, long-term effects are undocumented and unclear at this time.

In closing, I'll thank you again for the opportunity to be here and contribute, and point out that managing ARD is very difficult, especially in a historic mining district. Given the challenging conditions, and the potential harm, care is warranted in pursuing remedial activities. Owing to the lack of available documentation, is not clear just how just much care was exercised in the Gold King situation. However, I am optimistic that we will learn the details of this unfortunate event so that such things can be successfully avoided in the future.

Thank you.

[The prepared statement of Dr. Williamson follows:]

Statement of Mark A. Williamson, Ph.D. Concerning the Gold King Mine

Hearing of the Congressional House Committee of Science, Space and Technology

September 9, 2015

My name is Mark Williamson, I am a geochemist living in Loveland, Colorado, and I earned my Ph.D. from Virginia Tech, in the department of geological sciences. For the whole of my professional career, and extending back into my graduate study days, I have focused on the geochemistry of acid rock drainage (the type of solution discharged from the Gold King Mine), its management, and the associated issues of metals in aquatic and terrestrial environments. Consistent with the language in my invitation to this hearing, I am present to offer my education and experience to the committee in its examination of the circumstances surrounding the discharge of acid rock drainage (ARD) from the Gold King Mine.

Like many of my fellow Coloradans, other professionals that work with ARD issues, and citizens concerned with the quality of our water resources, I was disturbed by the discharge from the Gold King Mine. ARD has a significant impact on water resources, negatively affecting thousands of miles of streams and rivers throughout the United States.

To control, but not necessarily eliminate the discharge of ARD from disused mines, the engineered plugging of mine openings to regulate the flow of ARD has been a simple, relatively effective management technique, but results in a refilling of the mine workings with water. At the Gold King Mine, work plans from 2014 and 2015 that I have seen indicate that such refilling was anticipated and that a potential "blowout" condition was deemed to exist at the collapsed Gold King Mine portal, prompting the need for action.

Despite the anticipated filling of mine workings with water, and the potential blowout condition, field operations at the Gold King Mine used excavation equipment to dig open the collapsed mine portal. It is not clear that any investigations were conducted to assess how much water was present behind the collapse feature, or if there was any water at all. Given the uncertainty, the potential negative consequences, and the benefit of hindsight, a detailed assessment of the situation would have been advisable.

Any number of lines of investigation may have be pursued, including

- drilling a borehole behind the collapse feature,
- inspecting the the mine area for developing seeps and springs,
- searching for exploration boreholes that may extend into mine working,
- reviewing and inspecting older mine maps for potential other mine openings, or, as seems documented in work plans of 2015,
- inserting a pipe through the collapse to pierce it and check for the presence of water.

Of these, a borehole behind the collapse and a pipe piercing the collapse can be used to pump out water, to the extent it is present, in a controlled manner to remove the water and its associated risk. It is not clear from material made public that I have seen that any such investigations or evaluations were conducted.

Without further documentation it cannot be determined if site operations arbitrarily abandoned a conceptual site model (flooded) to dig open the workings, or if evaluation of actual water conditions behind the collapse had been conducted and led to a paradigm shift. Given, the ultimate outcome at the site, and the lack of specific documentation, it appears that appropriate risk reducing evaluations may not have been conducted.

The resulting discharge of ARD from the Gold King Mine was comprised of an acidic metal-bearing solution as well as a metal-containing sludge. Both of these can and do result in negative effects on the quality of receiving streams. The solution phase can result in immediate acute impacts and the sludge acute as well as more long term chronic issues.

Acute effects may have been temporal, largely avoided with the passing of the plume. The chronic, long term effects are undocumented and unclear at this time. Long term effects may include repeated exposure to metals through resuspension of sludge deposited in the river following rain or snow melt.

In closing, it is clear that managing ARD in general, and in older historic mining in particular is challenging. Given the challenging conditions, and the potential harm, care is warranted in pursuing remedial activities. Owing to the lack of available documentation, is not clear just how much care was exercised in the Gold King situation. However, I am optimistic that we will learn the details of this unfortunate event so that such things can be successfully avoided in the future.

Dr. Williamson is an environmental geochemist with over 25 years of experience in consulting, basic/applied research and educational settings. He holds a PhD from Virginia Tech, a Masters degree from Northern Arizona University and a Bachelor's degree from Old Dominion University. Mark has worked extensively in the mining industry and has been involved in geochemical studies and site evaluations across the United States as well the Philippines, Peru, Australia, Indonesia, Argentina, Canada and Mongolia. Dr. Williamson has extensive experience with acid rock drainage (ARD), which began began over 25 years ago with his PhD graduate studies in the kinetics of pyrite oxidation. His experience has expanded to include characterization of mine material for potential ARD formation using industry standard methods, prediction of water quality from mine facilities, support for engineered construction design of mine waste facilities, pit lake models, and water treatment design support. In addition to ARD, Mark has extensive experience with metals in aquatic environments, geochemical engineering, and the fate and transport of chemicals in the environment.

Chairman SMITH. Thank you, Dr. Williamson.

Before we go to questions, I'd like to recognize the gentleman from New Mexico, Steve Pearce, who obviously has an interest in the subject at hand, and we welcome him to the Committee today.

Mr. Stanislaus, let me direct my first question to you. On August 26th, EPA Deputy Administrator Stan Meiburg told reports on a conference call that there was "no evidence to suggest that precautionary measures were needed." However, I'd like to show you two documents on the screen. The first is a 2014 EPA Task Order, and the second is your own contractor's work plan from 2015. Both documents describe the potentially dangerous conditions at the mine, and specifically both state, and because the print is small, I'll read it on this PowerPoint: "Conditions may exist that could result in a blowout of the blockages and cause large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals."

I'd like to go to a second PowerPoint slide, and this is from the internal EPA email that appears to address the potential dangers at the mine. "The mine should be assumed to be full of water that is backed up to the top of the plug or higher."

So my question, Mr. Stanislaus, is this: Why did the EPA ignore these obvious warnings?

Hon. STANISLAUS. Well, from multiple of years, both the State of Colorado, local stakeholders had identified the fact of water buildup and the cave-in situations.

Chairman SMITH. So that even underlies my question even more. So why were the warnings ignored? You had—you were on notice for years.

Hon. STANISLAUS. Yeah, so——

Chairman SMITH. And we saw the Ranking Member put slides up. We've had other spills. Why were the warnings ignored?

Hon. STANISLAUS. Well, the warnings were not ignored. So it began with the identification of this particular segment. The reason why EPA was asked to be there was actually to address the water buildup and the cave-in situations. We specifically—and I'd like to read it for you——

Chairman SMITH. But my question is, okay, if they weren't ignored, why did the incident occur?

Hon. STANISLAUS. Sure.

Chairman SMITH. Why didn't you take the precautionary steps that would have prevented the spill?

Hon. STANISLAUS. Sure. So the work plan envisioned very specifically to carefully remove the rock buildup from the cave-ins and reduce that water. The work that was being done at Gold King Mine was an assessment to identify what the particular circumstance existed at the Gold King Mine. So at this point——

Chairman SMITH. And you didn't think there was any danger at this mine?

Hon. STANISLAUS. Well, clearly both EPA and the State of Colorado identified the risk of a blowout. This has built up because of a result of cave-ins over the years and water buildup. So that is the reason why we were up at that mine. So what we know at this moment is the internal review concluded that this was identified up front, the work plan incorporated these careful measures. The

experts of EPA and the State of Colorado looked at the site conditions, looked at sieves, looked at flows, and concluded that there was a low-pressure situation.

Chairman SMITH. Okay. Then what went wrong? If you knew there was a danger and you made the conscious decision to proceed, something went terribly wrong. Why did you proceed if you knew the dangers were so great or did you proceed in some form of negligent fashion because clearly you didn't expect and didn't want this spill to occur?

Hon. STANISLAUS. Sure. Again, none of us wanted the spill to occur. You know, the reason why we were there, to avoid this blowout. The reason why we were there was to avoid that blowout. So what we were doing there was actually doing investigative work, and per the work plan, the plan was to carefully reduce the buildup from the cave mine in, then to insert piping to reduce the——

Chairman SMITH. I understand what you might have had planned. Again, something went terribly wrong. It seems to me you did not heed the dangers or you certainly did not act to prevent the spill from occurring in an adequate fashion or the spill would not have occurred.

Do you feel that anyone was negligent at all?

Hon. STANISLAUS. Again, at this moment, what we have is an internal review. We're awaiting the independent review being done by the Department of Interior as well as Office of Inspector General. We will await the completion of all of those to make that assessment.

Chairman SMITH. And to date, has anybody been held accountable, or not?

Hon. STANISLAUS. Well, we've held ourselves accountable and most immediately we worked with the state and local communities to address the response. We've been working in a unified way, collecting data, communicating that data to local stakeholders so they can make decision.

Chairman SMITH. That's all well and good, but still a tragic spill occurred. It looks to many of us that no one's been held accountable. There has to be negligence or the spill wouldn't have occurred. And yet the EPA doesn't seem to acknowledge any negligence, it doesn't seem to take any responsibility, and that's simply a disappointment, I have to tell you.

I have time for one more question. Let me directly it very quickly to Mr. Greaney and Dr. Williamson. Do you think that this toxic spill was inevitable? If you can answer yes or no, that would be good. Do you think the toxic spill was inevitable?

Mr. GREANEY. I guess I'm not really qualified from an assessment standpoint on that mine to really answer that question. Certainly there was buildup that would have gone somewhere at some point, but I do not know if it would've resulted in a blowout.

Chairman SMITH. Do you think—okay. And Dr. Williamson?

Dr. WILLIAMSON. I would ultimately like to rely on more detailed evaluations. However, I wouldn't say that it's necessarily inevitable. It was in fact holding back quite a lot of water at this point, and there are other locations within the district that I'm aware of that act as opportunities for releasing pressure. So it remains to be

seen. It would have to be forecast with a little more certainty, I think.

Chairman SMITH. Okay. Thank you all.

And the gentlewoman from Texas, Ms. Johnson, is recognized for her questions.

Ms. JOHNSON OF TEXAS. Thank you, Mr. Chairman.

Mr. Stanislaus, how did EPA come to be involved with the efforts to address mine wastewater leakage at this Gold King Mine?

Hon. STANISLAUS. It actually began when the American Tunnel got plugged. When it got plugged, and this is a primarily issue by the State of Colorado with the Sunnyside Corporation, that plug-in resulted in the water increasing up to the Red and Bonita Mine and then the Gold King Mine. Subsequently, water seeps went into Cement Creek and Animas River. The stakeholders then asked EPA along with the State of Colorado to get involved to address that risk of water flow into the Animas River as well as the cave-ins at the Gold King Mine.

Ms. JOHNSON OF TEXAS. Now, I've heard that the installation of the last bulkhead at the American Tunnel in 2002 may have been a superseding cause to the blowout on August 5th. Can you please describe the history of the closure and the plugging of the American Tunnel and what its relationship might be to August 5th blowout at the Gold King Mine?

Hon. STANISLAUS. Yeah. EPA was not directly involved in that decision. What we do know from the internal review that was conducted was that a permit was issued by the State of Colorado to Sunnyside Mine that plugged the mine, you know, and as Dr. Williamson noted, that once you plug a mine, you will have water backup, and what we do know is that water backed up to the Red and Bonita Mine, which is a mine right on top of that, and then migrated out to the Gold King Mine, which then subsequently led to the water releases to Cement Creek and to the Animas River.

Ms. JOHNSON OF TEXAS. Thank you.

Mayor Brookie, thank you for your testimony and your characterization of the technicolor spotlight that has been placed on the problems your constituents and others for decades, if not longer. While I understand that the mining played an important role in economic development of the western United States, the impacts of abandoned mines are difficult to ignore. You note in your written testimony that mine blowouts like the one on August 5th are not uncommon putting this most recent release in context. Could you describe some of the past challenges your region has had to deal with as a result of mining activities?

Hon. BROOKIE. Certainly. We have—since the 1880s downstream users have grappled with related pollution in the Animas River as a result of acid mine drainage because in 1880 the mines just dumped this directly into the river, and by the 1890s the Animas River that ran through Durango ran gray and turbid—it was a quote in the Durango Herald from 1890—nearly every day thanks to mill tailings being dumped into the river near Silverton. This is approximately 55 miles away. Back in 1890, our town was covered with gray, turbid Animas River. It was not the clear river that we have today.

In 1902, Durango shifted its primary water source, potable water source—this is from the Animas River—to the Florida River, a tributary adjacent. It comes from another watershed that has less mining activity. So as far ago as 1902, we changed our water source, our primary watersource. We still use in the summertime the Animas River for the treatment facility and it meets water quality standards after being treated, but it's primarily—only used in the summertime for irrigation of a number of the fields and lawns and so forth. Our water increases by fourfold in the summertime.

In the 1930s, the farmers along the beautiful Animas River Valley north of Durango threatened to sue the mining companies to curtail their tailings, took legal action the mine because the tailings were clogging their ditches similar to what the Navajo Nation is experiencing today. The mine blowouts like the—in 1975, a huge tailing pond busted, sending 50,000 tons of tailings into the Animas River, turning it the cover of aluminum paint. This was just prior to my arrival in Durango, and people are still talking about this release, and if you can imagine, you pick a color. This was gray. It didn't show up on TV as bright as orange technicolor orange but we had the same thing happen in 1975.

In 1978, there was a huge burst of tens of millions of gallons of water and sludge came down our river. At this time it was black all the way to Black River all the way to Farmington. So pick your color. These are 24 different types of minerals that have impacted our river, our watershed, flowing all the way through Durango into New Mexico, into Arizona and into ultimately the Colorado River.

The Gold King Mine was draining anywhere from 200 to 500 gallons per minute prior to the blowout, and so there was—if you can envision this mountain as—you have a giant geologic Whack-a-Mole. You plug one mine, as has been discussed here today, and you build up the pressure of water. These are tunnels and vertical columns. They fill up with water naturally, and when these people are exploring the opportunity to release that and contain it, there was an accident. And so that is estimated 60 feet of water that created that three-million-dollar—three-million-gallon release that impacted us. It happened to be orange that day because of the orange oxide. That's probably the least health-critical element that was released. The color did, however, bring national attention to this issue.

We've had black, we've had gray, we've had all kinds of colors. Last year in the spring, there was a release of more than—a greater release than was experienced in the Gold King but it happened during the spring runoff in 2014, came down our very same river. We didn't even know it. Navajos didn't know it. Nobody knew it because it happened to be in the normal, turbid, brown color spring runoff, and it came through our town. That's what happens and that's what we have to deal with.

Chairman SMITH. Mayor, thank you for that response. We let you go a little bit over time, but that was interesting.

Let me recognize the gentleman from Georgia, Mr. Loudermilk, for his questions.

Mr. LOUDERMILK. Thank you, Mr. Chairman.

As I was listening to the statements and answers to the questions here today, I kind of heard a common theme as I've read the

reports of this event is, it's not important for us to find out who's to blame right now but other than to clean up the spill. It's understandable. But it seems to be when the government is at fault, they're not very anxious to figure out who's at fault, but if it's somebody else, we're more than willing to point the blame, even while the disaster and the cleanup is going on.

Let me bring attention to 2010, the Deepwater Horizon spill in the Gulf of Mexico, disastrous. It was disastrous to the people of that region. It cost many people their jobs. Many businesses went under because of this. Even while we were attempting to clean it up, the government didn't hesitate to go ahead and point fingers as to who was to blame. In fact, the former EPA Administrator, Lisa Jackson, and the Secretary of Homeland Security, then Janet Napolitano, send a scathing letter to BP saying they must be more transparent with what happened.

Dr. Benn, has in your opinion the EPA been transparent with what's going on so far?

Hon. BENN. Thank you for that question.

Well, as far as the farmers and the ranchers are concerned, they hadn't really been as transparent.

Mr. LOUDERMILK. Okay. Thank you.

Mr. Stanislaus, I appreciate you saying in summarizing, eventually we're going to get to what the issue is. But why are we only being transparent when this Committee goes forward and demand answers? Why is not the EPA coming more aggressively right now and coming out with what was the cause and what are we going to do to fix the situation? When are we going to see the transparency that this government demands of private industry or individuals when they're clearly at fault?

Hon. STANISLAUS. Well, thank you, Congressman. We believe we've been as transparent as we possibly could. Our initial focus was absolutely to collect the data and provide data in the hands of local communities, of the states and tribes to make decisions. Subsequent to that, we posted about 2,500 pages of documents, documents regarding the work plan, documents regarding the request proposal, documents regarding community meetings held with stakeholders, and we will continue to do so.

You know, with respect to holding ourselves accountable, you know, we first began with immediately and as aggressively as is possible to conduct a response in a unified way, making sure that the state and local government and tribes are part of the unified command. Clearly, we are only part of the way through. We've done internal review, because I was very interested what lessons learned relate to other sites around the country and what lessons learned in terms of what transpired there. But that's only part of the puzzle.

Mr. LOUDERMILK. Have you been more transparent than BP was?

Hon. STANISLAUS. Have I been more transparent? I think we've been very transparent. I've not done the comparison. But having been involved in the BP spill as well, I believe we in fact pushed transparency there, and I believe we executed the same level of transparency here.

Mr. LOUDERMILK. Ultimately, who's going to be held responsible for this?

Hon. STANISLAUS. Well, that is exactly where we are in the process of examining. You know, we've done an internal review. We have two other independent reviews, and we will see the culmination of that regarding what were the preparation and facts going into that event, how was that executed, and we're going to look at all of that.

Mr. LOUDERMILK. So do you agree that you should be held to the same standards that you hold everyone else to?

Hon. STANISLAUS. Absolutely.

Mr. LOUDERMILK. Do you agree to that?

Hon. STANISLAUS. Absolutely.

Mr. LOUDERMILK. After the Deepwater Horizon spill, President Obama appeared on the Today show in 2010 and stated had Mr. Hayward, the president and CEO of BP, had been working for him, he would have already been fired because of his role in the spill. Do you think we should hold the same standards?

Hon. STANISLAUS. Well——

Mr. LOUDERMILK. Should Gina McCarthy already—should we have called for her to be fired if definitely the EPA is responsible for this spill?

Hon. STANISLAUS. Well, I think we all want a fact-driven process. So we've done one step of the investigation. We await the independent review, and I think all the Members, all the public have also called for independent reviews. We're going to see the culmination of that. You know, roughly—I mean, the Department of Interior is doing a study in 60 days. I don't recall exactly when the Officer of Inspector General will be completing. Because we want a fact-driven process because I'm responsible for the cleanup of contaminated sites around the country at the request of states and local government. I more than anyone want to know—want to make sure that we're doing the right thing. So we're going to await that information.

Mr. LOUDERMILK. I appreciate that, and we're running out of time. All I'm asking for is that hypocrisy of this government hold the stop and that the government hold itself to the same standards that it holds the American people to, and that's what I think we must demand as we go forward.

Mr. Chairman, I yield back.

Chairman SMITH. Thank you, Mr. Loudermilk.

By the way, I don't remember President Obama waiting for an independent review, given the comments you just said.

The gentlewoman from Oregon, Ms. Bonamici, is recognized for her questions.

Ms. BONAMICI. Thank you very much, Mr. Chairman.

There's absolutely no question that what happened in Colorado is tragic, and I want to thank the witnesses for being here to help us learn more about why it happened, if and how it could have been prevented, critique the response of the EPA and how that was handled, and also talk about the lessons learned.

We also have to keep in mind that there are inherent environmental damages or dangers from metal mining operations and there are thousands of inactive mines around the country that are consistently leaking toxic wastewater full of heavy metals into streams, creeks and rivers. So we need the Environmental Protec-

tion Agency to review mining development to make sure that mining operations do not endanger crucial watersheds, and I want to also talk about the need to be proactive here and mention Pebble Mine in Alaska. EPA watershed assessment found that Pebble Mine would likely have an irreversible negative impact on the local watershed and salmon fisheries. Congressman McDermott and I led a group of our Oregon and Washington colleagues asking the EPA to protect Bristol Bay. Fisheries in that region provide thousands of jobs and millions of dollars annually to the economies not only of Alaska but also Oregon, Washington and the entire Northwest and the potential damage from a massive mine operation is a serious threat, and I hope that the lessons learned in Colorado are considered in that ongoing process.

But back to Colorado. Mr. Stanislaus, you said in your testimony that based on 2009 to 2014 flow data, the average annual water discharge from Gold King Mine and the three nearby mines reached approximately 330 million gallons per year, and the EPA and the State of Colorado and partners have been taking action to address that issue. So can you please talk about the ongoing—those ongoing discharges and the work that was being done there, and in your response, please address whether additional resources would have made a difference, and also would a Superfund designation or listing of the Gold King Mine have affected the resources and the approach available for cleanup and remediation? And I do want to save time for one more question.

Hon. STANISLAUS. Sure. So most recently, the Animas Stakeholders Group and the State of Colorado asked for EPA's assistance both from funding and technical expertise. That's what brought us to the mine, the Red and Bonita, and the Gold King Mine. But there was a preexisting effort by the Animas Stakeholders Group, who identified, Congresswoman, the multiple sources into the river that degrades the water quality. In fact, about 10 miles above the Animas River is degraded and fish health is severely compromised.

So just last week at the request of local communities, I actually traveled to Silverton to have a community meeting about whether a listing of Superfund would address this issue. We're in the middle of that conversation. And I presented that. To be eligible for Superfund resources, they have to be listed on the National Priorities List, and we're going to engage the local community regarding that.

Ms. BONAMICI. And Mayor Brookie, I want to ask you to follow up on that. I represent a district in Oregon and really understand the importance of preserving natural resources, and that's especially important to our tourism industry, which I know you share those concerns as well. So can you talk about how this recent release, which of course we all watched on television, some of you up close firsthand, how has it been treated in the media? Can you talk about what the coverage has done to your local economy and also address the Superfund designation because I know that's a discussion that's been ongoing in your community.

Hon. BROOKIE. Surely. Well, I might add that Ms. Gina McCarthy was in Durango, took full responsibility for EPA's role in this event. She was—there was a plastic table and a metal folding chair closer than the Chairman and myself sitting together, and she took

full responsibility. I did get a phone call the Thursday after the event from Sean McGrath, who's the Division EPA Director, asking from the city's perspective if we need any assistance at all from this event, and that was—and by the way, we were notified within an hour and a half at City Hall of the release. The event happened at about 10:58, and we were notified at 1:39 in the afternoon, and that allowed us to shut down our pump stations out of the Animas River, protect our potable water supply.

Ms. BONAMICI. And can I just ask you who notified you?

Hon. BROOKIE. Well, the Colorado Department of Health—Public Health and Environment, CDPHE, which is the appropriate protocol for EPA to notify the state health department. They notify downstream parties, which we were notified within an hour and a half.

Ms. BONAMICI. And then could you briefly address the effect on tourism that you've seen?

Hon. BROOKIE. Sure. Well, as you might imagine, I found myself with a barrage of cameras, everybody from al Jazeera to Fox News channel holding press conferences, et cetera, and infinitely showing the orangish plume coming through our town. It's still on the screen. It's good to see it again. I can tell you that orange plume no longer exists in Durango. It lasted for about a day and a half before it moved on to our friends downstream, Navajo Nation.

But we are—we immediately closed the river——

Chairman SMITH. Mayor Brookie, we've again run out of time.

Ms. BONAMICI. My time is expired.

Chairman SMITH. And I appreciate your response.

Hon. BROOKIE. Sure.

Chairman SMITH. We'll go now to the gentleman from Louisiana, Mr. Abraham.

Mr. ABRAHAM. Thank you, Mr. Chairman.

Mr. Chairman, first let me express my I guess awe at the Secretary of the EPA actually not being here. We all know in this room that if it had been an individual business, that business would have been vilified way before this. So I find it somewhat unconscionable that Ms. McCarthy chose not to be present at this hearing.

Saying that, Mr. Stanislaus, you said in your testimony that your experts at the EPA underestimate the water pressure. Now, I'm not a hydrologist but I can certainly estimate water pressure pretty easily with certain equipment. I've done it on my farm many, many times. I guess my question is, if they underestimated this, have they underestimated water pressure at other mines? I'm talking to you, Mr. Stanislaus.

Hon. STANISLAUS. So just to be clear, I mean, I am here because my responsibility is emergency response.

Mr. ABRAHAM. Yes, sir, I understand you're the cleanup man. You're fourth in the lineup as far as batters are concerned, and really you shouldn't even be here because it shouldn't have happened in the first place. You wouldn't even have a role in this. So my question to you is, your experts at EPA you have said in your testimony underestimated the water pressure.

Hon. STANISLAUS. Well, no——

Mr. ABRAHAM. Have they done this in other places?

Hon. STANISLAUS. So the pressure was not estimated. You know, the review report concluded that when they got on the site, they identified the potential for blowout conditions and——

Mr. ABRAHAM. And let me interrupt. Excuse me, sir, with due respect.

Mr. Greaney, with you and Mr. Stanislaus, sir, if you all knew that there was an issue here of potential blowout, was there a mitigation plan in place for this potential disaster?

Mr. GREANEY. The blowout potential as was identified following the issuance of the Task Order and some initial site work again represented there was six foot of water behind that bulkhead—I'm sorry, not a bulkhead, the collapsed tunnel. The intent then of the work plan was essentially to come in using that top four foot of open space between the water level and the——

Mr. ABRAHAM. But did you have a mitigation plan in place for this potential blowout because you knew it was a potential thing to happen? I mean, we all have mitigation plans in life for certain instances that can happen, and this is what the definition of a mitigation plan actually is. Did you have one in your company?

Mr. GREANEY. We had a management plan to again use the—a probe, much as Dr. Williamson had suggested, to insert into the well or into the mine and start pumping water.

Mr. ABRAHAM. So that was your mitigation plan? If it started to blow, you all were just going to pump water out?

Mr. GREANEY. I guess I'm not sure what—you're using mitigation, I'm using management plan. You're looking for a contingency plan?

Mr. ABRAHAM. Yes. Let's agree on that word. If it happened, what was your immediate first step, and did that happen?

Mr. GREANEY. Again, the blowout occurred during the initial—we had not started our site work. We were not prepared to enter the——

Mr. ABRAHAM. That answers the question. You weren't there. Okay.

And Mayor Brookie, you said that the EPA, the good news that day was that the EPA was actually there when it happened, and you know, I would use the analogy in medicine that a surgeon working on a lung slices the heart open, and we're glad that surgeon just happened to be there because he sliced the heart open. So, you know, again, it just is beyond pale, you know, that we're at this point where we have to have this hearing because nobody—like the Chairman said, there's totally a lack of transparency, and I think a lack of forthrightfulness here.

Mr. Stanislaus, has EPA estimated the actual money cost to the environmental impact on this spill?

Hon. STANISLAUS. Well, at this moment we've expended about $8 million of direct response costs——

Mr. ABRAHAM. How about referring to Mr. Benn as far as the Navajos, what he's asking for? Have you factored that cost into your figures?

Hon. STANISLAUS. Well, we have begun to pay response costs by those who have asked. Local governments are going to continue to provide those response costs. Separately, we've established a claims process under the Federal Tort Claims Act. We're going to be work-

ing through that process and completing that process within six months.

Mr. ABRAHAM. Thank you, Mr. Chairman. I yield back.

Chairman SMITH. Thank you, Mr. Abraham.

The gentleman from Colorado, Mr. Perlmutter, is recognized for his questions.

Mr. PERLMUTTER. I'd like to welcome my fellow Coloradoans to Washington, DC. Gentlemen, thank you for your testimony. All of you, thank you for your testimony today.

Part of this I feel like, you know, we're in the early stages of litigation, and the Chairman I think maybe a frustrated litigator wanting to figure out who was negligent, who wasn't negligent, who's responsible for this, what happened. I appreciate the fact that the EPA got to the Department of Health in Colorado quickly, who got to Durango quickly to share this. There apparently was some breakdown in communication getting to the Navajo Nation.

So in all of this, a court is going to figure out exactly what happened, why it happened, when it happened, should it have happened, Dr. Williamson, so—but I'd like to ask some other questions because I think, Dr. Benn, you suggested some things that the EPA should consider in the short term and in the long term. Those—if I recall correctly, one was, you know, help you with some monitoring devices to keep an eye on things, help the farmers and the ranchers who may have been impacted. Am I right about that?

Hon. BENN. Yes, sir.

Mr. PERLMUTTER. Are those conversations ongoing with the EPA at this point, or are you guys in litigation, or where are you?

Hon. BENN. Right now we're still in discussion.

Mr. PERLMUTTER. You're in discussions. Okay. So there is some conversation going on between the Navajo Nation and the United States of America through its EPA?

Hon. BENN. There's only discussion among us as a Nation right now.

Mr. PERLMUTTER. Oh, within your—within your own Nation. You're not talking to the EPA?

Hon. BENN. Yes, sir.

Mr. PERLMUTTER. Okay. I asked that badly. So you're—is the Nation speaking to the EPA about potential ways that the EPA and the United States could help the Nation?

Hon. BENN. As I explained to the U.S. EPA at one point that this whole situation can't be tackled all at once, that there's three parts. There's the spill, the reaction to the spill, and the coordination, the collaboration with EPA. We're actually in that stage right now. I think that they are working with us but to a certain degree.

Mr. PERLMUTTER. If I could, I'd like to have a couple of—the first slide showing exactly where this Gold King Mine is. Can we put that up on the board? No, the other one. Sorry. That one. Yes. Thank you.

So Mayor Brookie, Dr. Williamson, can you describe the area where this Gold King Mine is and approximately how many mines are in the Silverton complex, which I think, you know, range at least in the hundreds, if not into the thousands? Dr. Williamson?

Dr. WILLIAMSON. In response to your first point, the terrain is mountainous for sure, southwestern Colorado. It's a mining dis-

trict. It's fairly dispersed and widespread and there are multiple historic operations in the area. An exact number, I couldn't really tell you.

Mr. PERLMUTTER. And approximately when did the mining start in this area?

Dr. WILLIAMSON. Perhaps 130 years ago, give or take.

Mr. PERLMUTTER. And Mayor Brookie, do you know how many mines are up in that district, up in the complex above Durango?

Hon. BROOKIE. In my written testimony, I have a little diagram of the mines. There's hundreds of mines in and around that particular basin as well as in that—that's just Cement Creek. Then there is also, as has been mentioned before, Mineral Creek on the other side of the mountain as the Animas River primary tributary. They all feed into the Animas River as they come through Durango. But in that basin, there's virtually—in all, there's over 5,000 mine shafts at its tunnels and prospects in the upper Animas drainage.

Mr. PERLMUTTER. And in Colorado, we have many more than just in this area. I actually represented an engineering company years ago in another troubled mine with a big release that the EPA got in and we, you know, built some new treatment facilities and the like. So can we go to that other picture that was up there for a moment of exactly where this Gold King Mine is and the terrain right there? So—the other one. There we go.

So in preparing for this, this had been—there had been a release—there had been a slow leakage, if you will, of a couple hundred gallons per minute as opposed to three million gallons in a very short period, but over time there's a lot of liquid release—there was a lot of liquid released from this mine, and Mayor Brookie, I think you said like 300 million gallons per year or something like that. So——

Hon. BROOKIE. That's correct.

Mr. PERLMUTTER. —just for illustrative purposes, three million gallons which was released in that August 5th and August 6th time frame versus 300 million gallons per year. So we have a lot of work to be done with a lot of mines in the State of Colorado, and my question is, if the EPA or some federal agency doesn't help with this, who does? Mr. Stanislaus?

Hon. STANISLAUS. So we are called to address Superfund mining sites around the country. That's only a small subset of mines. So we get involved and do the work that we've been doing in this and all the mines around the country. Clearly, there are—just in Colorado, I believe there are 23,000 mines just in Colorado and hundreds of thousands of mines around the country, and that responsibility is split between other federal agencies and states.

Mr. PERLMUTTER. Mr. Greaney——

Chairman SMITH. Thank you, Mr. Perlmutter. Your time has expired.

The gentleman from Ohio, Mr. Johnson, is recognized for his questions.

Mr. JOHNSON OF OHIO. Thank you, Mr. Chairman.

Could I get the first slide, please? Mr. Stanislaus, this is the public Web site where EPA has been releasing information about the Gold King Mine spill including videos captured by EPA contractors

that show the blowout as it happens. According to the Web site, and I want you to look over on the far right-hand side there, EPA removed profanity contained in the audio of the videos and obscured visible license plates for privacy purposes, and then it ends with this: EPA did not edit the videos in any other way. So first question for you, Mr. Stanislaus. Is the statement I just read from EPA's Web site accurate?

Hon. STANISLAUS. It is accurate.

Mr. JOHNSON OF OHIO. Okay. Great. Do you have any reason to believe that it would not be accurate?

Hon. STANISLAUS. I do not.

Mr. JOHNSON OF OHIO. Okay. Here is video footage of the early stages of the Gold King Mine blowout that was obtained by the Science Committee. Let's have video number one.

[Video playback]

"Holding EPA Accountable for Polluting Western Waters," Full Committee Hearing
Animas River Stakeholders Group video transcript

I'm Peter Butler with the Animas River Stakeholders Group, one of the co-coordinators, and we're here at the Red and Bonita Mine, which is up in Upper Cement Creek. The Red and Bonita Mine, back in about 2000, only put out maybe 15, 17 gallons per minute of acid mine drainage which was not very heavily metal-laden. And now we have a drainage of around 300 gallons per minute, and it's loaded with metals and you can see it coming down the dump pile here in front of us. Back in 1996, a bulkhead was put in the American Tunnel, and then later, in about 2002, there were two more bulkheads put in the American Tunnel farther out near the surface. It was all part of a consent agreement between the mining company and the state of Colorado regulators, and at the time that raised the water table, and it's believed that because there's a higher water table, that's why we have all this drainage now coming out of the Red and Bonita. This is untreated drainage, it flows into the Cement Creek and goes on down to the Animas, and we can track and see the increase in metal loading from this site and three others all the way down to Baker's Bridge.

How many miles away do you think?

Probably about 45, 50 miles downstream.

Do you think it's had any effect on the aquatic life in the Animas?

It's clearly, these, the four sites up here, this is the biggest amount of water, the biggest flow, but the four sites up here have clearly impacted the Animas River down in the Animas Canyon. We've done fish surveys and we've done a bug analysis down in the canyon from Cascade Creek up to Elk Park, and clearly there's been a major decline in the number of species and the amount of species of both the macroinvertebrates and trout species. The American Tunnel used to drain about 1600 gallons per minute. The American Tunnel was an access to the Sunnyside Mine, which is by far the largest mine in the Silverton area, that the mining company stopped mining in 1991 and they were treating at 1600 gallons per minute and doing a good job of it up until this consent decree – they ended in a consent decree – whereas they were allowed to put bulkheads into the American Tunnel, and then they did a number of other projects throughout the Animas Basin to try to reduce metals to offset any seeps or springs that might pop out because of the bulk heading of the tunnel. Back in 2002 they had fulfilled the agreements of the consent decree and the state signed off on it. After that, probably around 2003, 2004, we started seeing a lot more drainage coming out of some of these mines up here in Upper Cement Creek. The four main mines that we've seen drainage increases – well, there's always some residual out of the American Tunnel, and then there's also increased drainages coming out of the Red and Bonita, which is here, the Gold King #7 level, and the Mogul Mine. Altogether, the increase in drainage varies a little bit to time of year, but it's about 600-800 gallons per minute of acid mine drainage which is untreated. That's probably the largest amount of untreated acid mine drainage in the state of Colorado at this time. Almost anywhere else that has that much of a drainage has a treatment plant on it. We're undergoing efforts to try to figure out a solution for – a cooperative solution – to try to mitigate and reduce the amount of metals coming out of these drainages. This area potentially could be a superfund site, the EPA thinks it has the criteria, but there's not a lot of local support for a superfund site. Therefore we're doing this collaborative process instead of going to a regulatory process at this time.

Mr. JOHNSON OF OHIO. Well, the next video is the exact same footage that EPA posted on its Web site but the last few seconds of the audio has been removed to prevent the viewers from hearing the team on the ground saying what do we do now. Let's have the second video.

[Video playback]

Mr. JOHNSON OF OHIO. So you said that you had no reason to believe that the EPA's Web site had been altered. I've just given you reason because the evidence is there, the before video and the one that you posted on the Web site. Why did the EPA edit out the audio of the team on the ground saying "what do we do now"? Do you got any idea?

Hon. STANISLAUS. I do not, you know, and EPA had provided its——

Mr. JOHNSON OF OHIO. That's good enough. After seeing both videos, do you think EPA's Web site is misleading to the American public?

Hon. STANISLAUS. I can't tell at this moment.

Mr. JOHNSON OF OHIO. What do you mean, you can't tell?

Hon. STANISLAUS. I would——

Mr. JOHNSON OF OHIO. You just saw two videos, one that had it and one that didn't, one that was clear and open, one that was posted by the EPA. How can you not tell?

Hon. STANISLAUS. I would need to compare all the——

Mr. JOHNSON OF OHIO. You just got a comparison, Mr. Stanislaus.

Hon. STANISLAUS. —circumstances behind the two videos and what the various staff and EPA——

Mr. JOHNSON OF OHIO. The EPA apparently had an on-scene coordinator on the ground during the spill. Is that correct? Do you have any idea? Is the EPA on-scene coordinator the one in the video who says "what do we do now"?

Hon. STANISLAUS. I don't know that information at this moment.

Mr. JOHNSON OF OHIO. Okay. EPA did not release videos of the incident for over a month after the spill, a month. How long did EPA know about video footage of the incident before it disclosed the videos to Congress and the American people? Do you have any idea?

Hon. STANISLAUS. Yeah. My understanding was, the video was provided as soon as possible, and I don't——

Mr. JOHNSON OF OHIO. A month?

Hon. STANISLAUS. Well, I don't know exactly when EPA obtained access to the video and the time period. We can get back to you regarding that time frame.

Mr. JOHNSON OF OHIO. All right. Mr. Stanislaus, this is another video of the spill after the toxic water was moving more rapidly. Let's go to video number three.

[Video playback]

Mr. JOHNSON OF OHIO. So if the EPA had known the answer to the question in the previous video, what do we do now, is it possible the EPA's response would have been better and prevented the water from escaping the mine so quickly? Could they have stopped this rush that we just saw?

Hon. STANISLAUS. Well, all I know at this moment is what is contained in the internal review, and what the internal review concluded that the risk of a blowout was identified as possible by both the State of Colorado and EPA. That was discussed with the Animas stakeholders——

Mr. JOHNSON OF OHIO. Okay. Good. I appreciate that. Hold on to that statement right there.

So given that the risk was identified, EPA had every reason to believe that a blowout was possible. Was the EPA prepared to properly respond to an environmental event of this magnitude?

Hon. STANISLAUS. Well, again——

Mr. JOHNSON OF OHIO. That's an easy answer because we got three million gallons of toxic water that ran into the river. Were they adequately prepared?

Hon. STANISLAUS. So because of that risk——

Mr. JOHNSON OF OHIO. Yes or no.

Hon. STANISLAUS. I need to answer that question. Because of that risk, they put in place specific plans——

Mr. JOHNSON OF OHIO. Okay, but they didn't execute their plans.

Hon. STANISLAUS. If I can—so in the work planning, so the whole point was to carefully remove the rock buildup and then remove the water as part of the investigation phase. The investigation team also concluded that the emergency response component of the plan did not include the worst-case scenario of a blowout and that's something that I committed to going forward to make sure that happens.

Mr. JOHNSON OF OHIO. Well, according to news reports, the EPA failed to notify local officials including the Navajo Nation for 24 hours after the spill. They did not have a plan to deal with an environmental event of this magnitude, and clearly what do we do now, that question, they didn't have an answer to.

Mr. Chairman, I got lots more that I could talk about but my time is expired.

Chairman SMITH. Thank you, Mr. Johnson.

The gentleman from Virginia, Mr. Beyer, is recognized for his questions.

Mr. BEYER. Thank you, Mr. Chairman.

And with respect and in the spirit of fairness, I do want to say that I object to the pejorative and accusatory title of the hearing: "Holding the EPA Accountable for Polluting Western Waters." I think it's been very clear from the testimony today that the EPA was very far from being the first mover in the release of the heavy-metal-laden mine wastewater, and it's an untenable stretch to say that the EPA is solely responsible for this spill. Just remember, it makes no sense to compare Deepwater Horizon to this spill. There's tens of thousands, perhaps millions of difference in order of size and impact.

The EPA was only at the site because it was concerned about the decades-long problem of contaminated wastewater release, and blaming the EPA for the larger problem of the wastewater release is like blaming firefighters for the forest fire.

Three million gallons were released on August 5th. As we've heard today, three million gallons are released every week year in and year out. I'm very concerned about what Dr. Benn has talked

about, this impact on the Navajo Nation. I like to think about the larger impact to the Navajo Nation about all those gray releases and black releases and others that Mayor Brookie talked about.

And on the call for accountability, we've already heard that the EPA has released 2,500 pages up on the internet, and yet to hear any resistance from Mr. Stanislaus about not being willing to come forward with all the transparency that is requested, and I have yet to hear a description of what the EPA is somehow withholding. You know, we want to hold people responsible but it seems to me that they're doing their best to come forward.

Two years ago, Peter Butler, the Coordinator of the Animas River Stakeholders Group, appeared in a video that highlighted the history of the mines in that region. I'd like to ask that that video be shown now.

[Video playback.]

Mr. BEYER. Mr. Chairman, thank you for letting me go a few seconds over.

Chairman SMITH. There's no time for questions, though. That's the problem.

Mr. BEYER. I'll just point out that that video was done in 2013, two year before the EPA spill.

Chairman SMITH. EPA had plenty of notice of the dangers of mine spillage, and I thank the gentleman for pointing that out. If you have a question, we'll acknowledge you for another extra 30 seconds. Okay. Thank you, Mr. Beyer.

The gentlewoman from Virginia, Ms. Comstock—no, I'm sorry. The gentleman from Arkansas, Mr. Westerman, is recognized for his questions.

Mr. WESTERMAN. Thank you, Mr. Chairman.

Mr. Greaney, I have with me a copy of the action work plan. On the title it's "Environmental Restoration LLC." Who prepared this document?

Mr. GREANEY. That is traditionally prepared by our response manager assigned to the project.

Mr. WESTERMAN. Okay. So how many layers of approval did this document go through?

Mr. GREANEY. That document would be basically a collaborated effort between the on-scene coordinator from the U.S. EPA as well as the response manager, and those two—the OSC, the on-scene coordinator, would traditionally sign off on it as is accepted.

Mr. WESTERMAN. So somebody from your company signed off on it and somebody from the EPA signed off?

Mr. GREANEY. The response manager from our company as well as U.S. EPA on-scene coordinator.

Mr. WESTERMAN. So were professional services employed by engineers, geologists or hydrologists used in preparation of this work plan?

Mr. GREANEY. No, that would have been any data that—we work off of the data that is provided to us within the Task Order as well as any other data that's provided by the federal on-scene coordinator at the time of the Task Order. We are not an engineering form. Data is provided to us by the agency.

Mr. WESTERMAN. But this is clearly engineering-type work, so who was qualified to prepare this plan?

Mr. GREANEY. The engineering component of our Task Order would have been the actual structural design and installation of the entranceway to the mine as well as the completion of the tunnel work, and that would have been subcontracted to a specialized subcontractor who is already on contract and ready for us to initiate the work.

Mr. WESTERMAN. So a professional engineer subcontractor prepared——

Mr. GREANEY. No, we prepared that plan, and then there was a subcontractor to us who came in subsequent to that plan to do the engineering, design and installation of the restoration work after that plan was submitted.

Mr. WESTERMAN. So were there engineering design documents, drawings or specifications?

Mr. GREANEY. I don't know the answer to that. As far as the actual construction phase of that, I don't know.

Mr. WESTERMAN. So were you involved in this project?

Mr. GREANEY. No. Not directly, no.

Mr. WESTERMAN. So would it not be normal practice if somebody's out doing the work that they would have the plans and the specifications?

Mr. GREANEY. The work plan—again, it's more of a timing issue, I believe. That plan would've been turned in within, say, 30 days or so, 60 days, and it varies depending on what the federal OSC wants, and it's the preliminary approach. The way our contracts work is, we're giving, you know, a set of technical directions and then we define an operational approach to meet that technical direction. So that was a plan saying here's how we're going to get there. It mentions that we're going to hire a competent contractor to do that work but it doesn't define who because it hasn't been procured yet.

Mr. WESTERMAN. It doesn't say anything about hiring anybody for professional services. It does talk about subcontractors. This document was provided for transparency purposes on the EPA Web site, and it lists three attachments that weren't included in the document, which I think would be pertinent to the document. The first one is the cost estimate. What was the total cost of this project?

Mr. GREANEY. I do not have that information. I can certainly get it for you.

Mr. WESTERMAN. And then the schedule wasn't included. Do you know the time frame of the schedule?

Mr. GREANEY. I believe the schedule, the safety plan and the cost were the three attachments, and my understanding was, we did turn those over minus the cost was redacted for confidentiality reasons.

Mr. WESTERMAN. I think that's pertinent to the issue in that my question is, was there adequate cost and adequate time allowed to do this job properly?

Mr. GREANEY. There was certainly the cost and schedule provided to do the project as was originally understood, yes.

Mr. WESTERMAN. So why would that be redacted out of the document?

Mr. GREANEY. For—the cost itself was unit cost as part of her contract, and that was confidential business information that was redacted.

Mr. WESTERMAN. And also not included in the document is the site health and safety plan. Was there a site health and safety plan?

Mr. GREANEY. Yes, there is, and again, it's my understanding that it was released. I don't understand why you didn't have access to it.

Mr. WESTERMAN. Okay. So we're really not sure about how design engineering was done on this project and if the people who approved the work plan were qualified to approve that. Because there was obviously a lack of planning that went into this because of the spill that occurred.

But Mr. Stanislaus, is there—is this common practice?

Hon. STANISLAUS. Is what common practice?

Mr. WESTERMAN. To prepare these plans without professional services?

Hon. STANISLAUS. Well, clearly, there's a whole sequence beginning with the request for proposal which identified the specific circumstances and risk. It then goes into a work plan. It then goes into a construction plan and execution plan. You know, what the review team found was, the expertise both of the State of Colorado, EPA and the contractors were the right expertise so the mining expertise was in place. They had a plan to execute that, and the review report goes through how that report—how the plan was executed.

Mr. WESTERMAN. Most laws—most states have laws that say you can't do this type of work without a professional in charge of the work, so does EPA exempt following state laws on professional services for these type projects?

Hon. STANISLAUS. Well, all the appropriate professionals for this job—our review team found that the expertise for doing a job like that was in place on this project team, both EPA and the State of Colorado and the contractor.

Chairman SMITH. And the gentleman's time has expired.

The gentleman from California, Mr. Takano, is recognized.

Mr. TAKANO. Thank you, Mr. Chairman.

I just want to get back to proportionality. Three million gallons in 1–1/2 days was visible as orange oxide in the water four miles adjacent to this mine, but 300 million gallons, I understand, flow of waste that wasn't visible, was not captured in the visual, and that's why we have this visual to make this comparison. So it's a matter of proportionality.

I find it curious that this Committee is focusing on this and spending hours and hours and hours of time trying to figure out in the wrong venue. It should be a court of law figuring out the liability, and we're jumping to conclusions in this, and the title of this hearing is even jumping to a conclusion which, you know, was misleading, when we should be talking about this, and in the spirit of that, I would like to yield more time, my time, to the gentleman from Colorado to continue his questions.

Mr. PERLMUTTER. Thank you, Mr. Takano. If the Committee would allow me to go forward?

Chairman SMITH. Absolutely. Would the gentleman—would Mr. Takano yield just for a minute or for a couple of seconds?

I can't wait to use the gentleman's arguments the next time a private company dumps millions of gallons of toxic water into a pure river, and thank you for yielding, and the gentleman from Colorado will be recognized.

Mr. PERLMUTTER. Thank you, Mr. Chair.

So I think Congressman Beyer, Congressman Takano have really hit on the key point here, which is, as Dr. Williamson said, we've got thousands of mines in Colorado, many abandoned, many properly closed with all sorts of issues, and at some point we've got to address them. We've had, you know, lakes collapse into mine shafts, causing huge releases down the Animas River and into the San Juan and into the Navajo Nation.

So let's just go back to basics here. So the EPA started working on this at least with the stakeholder group and with its professionals in 2014, did it not, Mr. Stanislaus?

Hon. STANISLAUS. Yeah, slightly before 2014.

Mr. PERLMUTTER. So you worked with affected individuals to try to figure out what to do to minimize that 300 million gallons that was being released into a river that runs right through the heart of Durango and into the Navajo Nation. Is that right?

Hon. STANISLAUS. That's correct.

Mr. PERLMUTTER. And in so doing, you contracted with the private sector to do the construction and remediation work that the professionals felt was appropriate, did you not?

Hon. STANISLAUS. That's correct, with EPA oversight.

Mr. PERLMUTTER. And that one of those contractors was you, Mr. Greaney, and your company, true?

Mr. GREANEY. That's correct.

Mr. PERLMUTTER. And listening to your testimony, you've done some 1,300 similar kinds of tasks for the EPA, and I think you testimony was 10,000 for other agencies and the private sector.

Mr. GREANEY. That's correct.

Mr. PERLMUTTER. The kind of work you do can be dangerous. Isn't that true?

Mr. GREANEY. That's also correct.

Mr. PERLMUTTER. And it can be complex?

Mr. GREANEY. That's correct.

Mr. PERLMUTTER. Can you—how would you describe all of the tunnels that you're dealing with in this Silverton complex or the Silverton mining district when you were working on the Gold King Mine?

Mr. GREANEY. They're obviously very complex.

Mr. PERLMUTTER. And so the Chairman started off his statement saying well, would a prudent person undertake this? Well, one prudent person, probably not, but when 300 million gallons a year are coming into a beautiful river where into a city that prides itself on being very outdoors and very health conscious, should the United States and should the State of Colorado, even though it may not be prudent, try to undertake to fix something like that? Mr. Greaney, what would you say?

Mr. GREANEY. We address many, many task orders on behalf of the U.S. EPA, and all of them have a basis for each one.

Mr. PERLMUTTER. And Dr. Williamson, in your experience, does the EPA, does the Division of Mine Land Reclamation in Colorado, do other agencies try to undertake to mitigate against a constant release like this 300 million gallons?

Dr. WILLIAMSON. Yes, sir, in my experience they do try to offset the sustained discharges.

Mr. PERLMUTTER. And at some point my guess is, you've been called as an expert witness in a trial or you've advised in the past, and hopefully all the things that you've worked on have gone well, but this is complex and dangerous kind of work, is it not?

Dr. WILLIAMSON. I would agree that it is, yes.

Mr. PERLMUTTER. I thank Mr. Takano for giving me time. I thank all of you for being here. There's no real bad guy. We're trying to fix something that's been 100 years in the making, and we've got a lot of these in Colorado, and we need some help with treatment plants in Silverton. They need it on the Navajo Nation. This is a responsibility that we have as a Nation. Thank you.

Chairman SMITH. Thank you, Mr. Perlmutter.

The gentleman from Michigan, Mr. Moolenaar, is recognized for his questions.

Mr. MOOLENAAR. Thank you, Mr. Chairman.

I'd like to address these to Mr. Stanislaus. I wanted to ask you what lessons that you and the EPA have learned from this incident, this experience?

Hon. STANISLAUS. Sure. I mean, so far, you know, we've identified that we need to enhance the notification process with local and state governments. I issued a memo to that regard asking all the regions to work with state and local communities, an event like this, which potentially has broader potential impact.

The review team also identified that there are a number of things that we could do and operationalize going forward by looking at and investigating with the private sector potential remote sensing tools to identify a pressurized situation where it's technically and from a safety perspective is really difficult to put a drill pad like it was in this location, incorporating worst-case scenarios in emergency response planning. So those are some of those, and some of that's contained in the internal review document, but it's ongoing lessons learned. I mean, we learn lessons from the thousands of sites that we get engaged in around the country.

Mr. MOOLENAAR. And in terms of overall cost of this, someone had mentioned maybe $8 million is what has been spent so far. Is that accurate?

Hon. STANISLAUS. That is right. It's $8 million for the response costs so far.

Mr. MOOLENAAR. And do you anticipate additional costs beyond that?

Hon. STANISLAUS. Yeah, I mean, certainly some additional costs. I don't know what that estimate is. There's still going to be some ongoing monitoring. We'll continue to work all of the stakeholders on continuing that monitoring and other kinds of elements to accommodate the stakeholders' requests.

Mr. MOOLENAAR. And how do you—where do you get the funds for that? Is that from other programs that maybe of lesser priority

that you'd shift within the EPA budget, or how—where would you get that funding?

Hon. STANISLAUS. Well, the budget and all the federal budget is fairly regimented. We have a fixed pot of resources, Superfund, kind of emergency response and removals, and what we do is really prioritize. You know, clearly there are priorities that come up and we need to respond to emergencies and prioritize as we go forward. You know, it's a tight budget and we've had declining resources over the years.

Mr. MOOLENAAR. So it would come out of the Superfund budget projects that—lesser priorities would kind of go to the bottom of that list and you'd move that to this?

Hon. STANISLAUS. Well, yeah. We have a pot of money to make ourselves available to respond to emergencies on a regular basis, so, you know, we use that pot of money to respond.

Mr. MOOLENAAR. And what—I have not heard—has EPA—obviously has taken responsibility for this but has EPA acknowledged mistakes that were made that—you know, for instance, there's also this comparison, you know, are you—how would you treat a private actor if they were in this situation? Obviously you're in the position where you're investigating, you are conducting the operations, but then you're also responsible for any penalties. Would you treat a private actor differently than is—is there a conflict of interest here?

Hon. STANISLAUS. Well, we would treat the private actor identically. So for example, when an incident happens, what we ask—what we demand of the responsible party is to immediately go forward, expend resources, collect data immediately, analyze that data, provide water supplies as an example, and, you know, we would impress the unified command emergency response structure. So that is identical. You know, we would demand transparency, and I believe we are identically in transparency. I would argue, you know, very forward leaning on transparency.

I mean, in terms of long term, you know, we're still in the midst of investigating. So I ask for internal view and the Administrator asks for internal review to quickly identify what happened here, how that should inform other sites immediately. You know, we also—there's also two other independent investigations, so we should have the Department of Interior's investigation done roughly—I know it's 60 days from the time it started, so I'm guessing it's about 40 days or so, and the Office of Inspector General of EPA is also conducting—so we're going to, you know, see all of what is identified. So again, you know, I have responsibility for the cleanup of contaminated sites around the country, you know, and we work with communities to protect public health and safety from the legacy of these sites. If there are lessons learned, you know, and if there are ways of holding people accountable, holding ourselves accountable in those documents, we will certainly look at that.

Mr. MOOLENAAR. Do you think it would be——

Chairman SMITH. The gentleman's time is expired.

Mr. MOOLENAAR. Thank you, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Moolenaar.

The gentleman from California, Mr. Swalwell, is recognized.

Mr. SWALWELL. Thank you, Chair, and you know, to the people of the communities affected, you know, I do—I share, you know, my thoughts, my concerns. This was a tragedy. And to me, it seems like it's inherently dangerous work when you're dealing with mines. It's dangerous for the EPA, it's dangerous for the contractors, and it's awful when anything like this happens. And, you know, I don't agree with the name of the hearing, Mr. Chairman, but I do agree with the right to have a hearing about something that involves an important government agency. In my experience, these types of incidents will take some time to thoroughly be investigated and hopefully we get to the bottom of it, and I think this is a part of that process.

Mr. Stanislaus, I just have a few questions. First, is it contemplated that there could be a breach of contract or litigation brought against the contractor or subcontractors involved? Is that possible going forward?

Hon. STANISLAUS. Well, again, we are going to evaluate the two other reports that are coming down, and we're going to have to evaluate more of the specific facts. We have one independent review, and you know, it speaks for itself that there was proper planning, the work plan seemed to be executed. There's potentially more than could be done in the future. So that's currently where we are.

Mr. SWALWELL. And Mr. Greaney, that's not a comment one way or another on your work, but I do want to highlight just to my colleagues on the other side that it does seem that if there is a right of action available against a private actor, that that is something that is possible. Is that right, Mr. Stanislaus?

Hon. STANISLAUS. That is right.

Mr. SWALWELL. And then I do—with that in mind, I would like to yield the rest of my time. I think it's important for the Member who's most closely affected by this to continue to have questions if he wishes. So Mr. Chair, the gentleman from Colorado, I'd like to yield to him if possible.

Mr. PERLMUTTER. I thank my friend from California.

Mayor Brookie, you did mention the Good Samaritan bill that was proposed by Senators Udall and Bennett and I think Congressman Tipton, which I generally support, but in this instance, it wouldn't have helped. I mean, we actually were working on a mine and there was a major release.

Hon. BROOKIE. That's correct.

Mr. PERLMUTTER. So in the—in connection with the $8 million that the EPA has spent so far, what has been done for the town of Durango, if anything, with that $8 million? Can you tell us?

Hon. BROOKIE. Well, perhaps Mr. Stanislaus could answer that, but, you know, we have submitted—we'll be next week submitting an invoice to the EPA for direct costs associated with emergency response, loss of sales of water in our case, and a number of other direct costs to the City of Durango. Obviously the business community will be submitting via the form 95s for any loss of their business. That would be the whitewater rafters, hotels, any of the public business, private businesses that would have a claim for loss of income and loss of business.

Mr. PERLMUTTER. Okay. Mr. Stanislaus, the $8 million, and I know there was a previous question, what of that $8 million—explain the mitigation that took place immediately after the release and how, you know, ,protecting the life and limb of your contractors and of your own personnel and then what you've done to slow down this release.

Hon. STANISLAUS. Sure. Immediately after the release, we kind of shored up the situation. We diverted the water so it could be treated, so we have treatment ponds diverting and treating the water. We believe we're capturing about 90-plus percent of the metals in a far better case than described in the video with the untreated water. We still have more to do in terms of a long-term solution. That is why I was in Silverton having that discussion.

Mr. PERLMUTTER. So let me ask this question. In the video that Congressman Beyer showed us, there was a discussion of making the Silverton mining district or at least these mines, put them on the National Priorities List, make them part of a Superfund site. How would that affect your ability to pay for, you know, new treatment plants for the area, for the Navajo Nation? Can you explain?

Hon. STANISLAUS. Sure. By being listed on the National Priorities List, it makes that site eligible for a permanent and long-term solution. So in mining sites like this, one of the fundamental things that are done is a permanent water treatment system to handle the volume and really reduce all the contaminants, in this case, metals, before it enters into the rivers.

Mr. PERLMUTTER. Thank you, and I thank my friend from California.

Chairman SMITH. Thank you, Mr. Perlmutter.

Mr. SWALWELL. Thank you, and I yield back.

Chairman SMITH. The gentleman from Texas, Mr. Babin, is recognized.

Mr. BABIN. Thank you, Mr. Chairman. I appreciate that.

Mr. Stanislaus, during the spill, President Obama came out and visited the region but he did not visit the site or meet with those who are affected by the spill. Did the EPA request that President Obama not visit the spill site?

Hon. STANISLAUS. Well, all I can tell you is that EPA shifted into emergency response. We had emergency response personnel working emergency response with local stakeholders. Administrator McCarthy did visit the area, met with local officials, really want to make sure that the emergency response is well managed.

Mr. BABIN. Again, I think, as someone mentioned earlier, I think it's ironical that she's not here today either. But let me ask, does it surprise you that President Obama visited the area but did not come to the site or visit with the folks who are affected as the Navajos were?

Hon. STANISLAUS. Well, all I can tell you is that from where I sit, you know, we want to make sure that the emergency response infrastructure is in place. We did that and unified command had the local government, the states and tribes involved. Administrator McCarthy did in fact visit all the local communities, visit the Navajo while she was there to gauge how the response was going and how we could be of assistance.

Mr. BABIN. All right. Well, then let me ask you this, a few technicalities. What was the relationship between the EPA and the Environmental Restoration LLC staff on site conducting work at this particular mine?

Hon. STANISLAUS. The——

Mr. BABIN. What was the relationship?

Hon. STANISLAUS. Well, they are a contractor who pursuant to a request for a proposal put in place a work plan to deal—to address the work at this site. EPA oversees the work by the contractor.

Mr. BABIN. Okay. Does the EPA specify what exact work will be conducted and each step of the work?

Hon. STANISLAUS. Well, it's kind of a—it is a sequential process. So we issue a request for proposal detailing the particular circumstance we'd like the contractor to address. We ask the contractor to respond with the work plan and then there are other additional implementation kind of documents.

Mr. BABIN. Well, I just—I want to know, does the EPA have the final decision-making authority on this site?

Hon. STANISLAUS. Absolutely.

Mr. BABIN. Okay. Did Environmental Restoration LLC ever raise any concerns regarding the work to be conducted at Gold King Mine? We've seen some videos today which kind of alluded to that possibility. Had the Environmental Restoration, did they ever raise a red flag?

Hon. STANISLAUS. Well, what I am aware of is, we raised the issue of the particular circumstance at the Gold King Mine, we and the State of Colorado. That's the reason why we were there. And it's to deal with the particular circumstance. The particular circumstance was that there was a cave-in at the Gold King Mine area. There was water seeping from that. The contract was to address that particular situation while also addressing the mine beneath that, the Red and Bonita Mine, as well.

Mr. BABIN. So the cave-in was what—was that the exact cause of the spill?

Hon. STANISLAUS. Well, again, there's a preexisting condition, you know, going back over a decade or so. Initially the State of Colorado worked with the mining operator to deal with the cave-in situation, deal with the water emitting from the complex of mines. So that had been going on for years. They've addressed some of the cave-in. We got involved right around 2014 to deal specifically with the Red and Bonita and the Gold King Mine, developed a plan as you all have in front of you.

Mr. BABIN. Who were the folks that were operating the machinery that day? Were they EPA employees or Environmental Restoration employees? Who were they?

Hon. STANISLAUS. Well, they were subcontractors, as Mr. Greaney talked about. I don't have those individuals' names in front of me.

Mr. BABIN. But I just want to know who they work for.

Hon. STANISLAUS. Well, they ultimately work for EPA, absolutely.

Mr. BABIN. Okay. They were EPA employees but they were contractors?

Hon. STANISLAUS. No, no, no. They were contractors, subcontractors to the prime contractor.

Mr. BABIN. Not with Environmental Restoration?

Hon. STANISLAUS. Well, you know, on typical jobs like this, you have a prime contractor and you bring particular expertise. The subcontractor that you're referring to had a particular expertise in mining operations.

Mr. BABIN. It's unfortunate, very unfortunate thing to happen, and it brings to mind in North Carolina, we had a rancher or a farmer who accidentally spilled some cow manure into a local river and was fined $15,000, which is a lot of money for some folks, and I'd like to see some responsibility shouldered by the EPA here, and I'm very disturbed that it took 24 hours to inform the folks downriver of the spill even occurring. Don't you think that's——

Hon. STANISLAUS. Again, as I outlined in my opening statement, there was immediate notification between us and the State as set forth in a contingency, in a plan for notification, but I also agree, an incident like this, we need to have broader notification, us, state and local governments and tribes, and make sure everyone is aware. All the notification did occur before any of the impacts of the spill reached them.

Mr. BABIN. I would imagine if you lived downstream, you would've wanted to be notified——

Hon. STANISLAUS. Absolutely.

Mr. BABIN. —very, very rapidly.

Hon. STANISLAUS. Absolutely.

Mr. BABIN. Thank you. Thank you, Mr. Chairman.

Chairman SMITH. Thank you, Mr. Babin.

And the gentleman from Alabama, Mr. Palmer, is recognized.

Mr. PALMER. Thank you, Mr. Chairman.

Mr. Stanislaus, there was an article by the Associated Press back on August 20th in which the article says that the EPA is now downplaying the danger of the Colorado mine spill but concerns linger that contamination levels are pretty serious yet the EPA says that the contamination levels were returning to pre-spill levels and no threatens the rivers. Do you agree? Is that the EPA's position?

Hon. STANISLAUS. Well, EPA put in place an aggressive data program working with everyone in unified command that include the state, the tribes and all the local governments. We then went through a laboratory process and then compared that to preexisting levels and made a judgment once we achieved pre-existing levels. We communicated that in unified command then the local governments made a decision about reopening the river.

Mr. PALMER. The AP article also said that they made repeated requests to the EPA for information on pre-spill contamination so that they obviously could compare that to the current contamination levels. At the time of the article, the EPA had failed to respond to that request. Has the EPA provided that information?

Hon. STANISLAUS. Yeah, it is on our Web site where we have tables and graphs and the actual data that compares the data taken on various days to pre-spill conditions and other parameters.

Mr. PALMER. So was it on your Web site around August 15th to 20th time frame? Was it there then?

Hon. STANISLAUS. Yeah, I don't have the article in front of me. I don't know what particular time frame they were talking about.

Mr. PALMER. The article was on August 20th.

Hon. STANISLAUS. But as soon as we could collect and process the data, we posted it on our Web site. I mean, clearly there is a laboratory process, particularly with metals, takes time to analyze that, but as soon as we had that data available, we not only posted it in the press but immediately we communicated with state and local and tribal officials.

Mr. PALMER. Okay. Are you satisfied with the levels of contamination of arsenic and lead and other contaminants that are currently in the river? Is that consistent with what you require from private companies in terms of wastewater discharge?

Hon. STANISLAUS. Well, what we addressed was whether the river has been restored to pre-spill conditions. However, the Animas River Stakeholders Group and the State of Colorado had long recognized that there was a whole load of contaminants going into the river and that is the reason I was in Silverton just last week at the request of local communities to examine the possibility of a long-term solution through a Superfund potential listing.

Mr. PALMER. But you've approved it for recreational use again, and based on your analysis of the contaminants in the river, yet other health agencies have advised people not to drink the water and not to basically come in contact with the soil. That seems to me to be inconsistent with a water source being ready for recreational use.

Here's the problem I've got with this, and I—you know, the EPA plays an important role, and I've been a vocal critic of the EPA. My problem with this is, there appears to be a double standard. It's been mentioned several times here. If this had been a private company, I don't think the EPA would share the same optimism if this had been a private company. I don't think the EPA would have handled them the same way that the EPA has handled itself in regard to Mr. Johnson's video and the obvious alterations to the video. I think it's problematic that the EPA is not doing the due diligence and investigating this and handling this the way they would if it were a private company. I mean, Mr. Babin mentioned a rancher in Texas. There's a guy I think in Wyoming who built a pond and they're fining him, what, $35,000, $37,000 a day. I just don't see—I see a real problem here with the way the EPA handles this and everything's fine, look the other way, there's nothing going on here, but you wouldn't do the same thing if it were a private company. You would destroy the company.

Hon. STANISLAUS. Well, all I can say is that from a transparency, taking responsibility for the spill, we've done it, and you know, EPA is involved in thousands of contaminated sites around the country. I take that responsibility very seriously. I want to make sure—because communities and states ask us to be involved because of the public health and environmental dimension of that problem. I want to make sure that work is done because ultimately I think we all want to address the conditions that resulted in locals asking us to provide assistance. So I am committed to learning the lessons from this site as well as others.

Mr. PALMER. That is what we all want. That's what we want for Durango. That's what we want for the Navajo Nation. That's what we want in every community in the country, ever municipality that is under an enormous burden imposed by the EPA, and it appears to me, Mr. Chairman, that there is a double standard.

I've gone over my time. I yield the balance. Thank you.

Chairman SMITH. Thank you, Mr. Palmer.

And the gentleman from Oklahoma, Mr. Bridenstine.

Mr. BRIDENSTINE. Thank you, Mr. Chairman.

Dr. Benn, the EPA triggered a spill that has done damage to the Navajo Nation. They then took the lead in the aftermath of the spill and now they are investigating themselves. This seems like a clear conflict of interest. Does this concern you?

Hon. BENN. Yes, it is a clear conflict of interest, and we have approached officials about trying to figure out if we can actually have somebody appointed other than the EPA to do the investigation.

Mr. BRIDENSTINE. Do you believe that the EPA will hold itself accountable? Earlier we saw a video from Representative Bill Johnson from Ohio, he had a video, and it indicated that maybe the EPA might not be totally forthright about how they're presenting themselves in this matter. I mean, is this of concern that maybe the damages might not all be prevalent because they're investigating themselves?

Hon. BENN. Well, just to be clear about how they communicated information to us form the beginning, it wasn't until 24 hours later that they let us know what happened, and at the same time, when they did let us know, it wasn't really them that told us about what happened. It was actually the State of New Mexico that approached us and told us about all this information.

Mr. BRIDENSTINE. It appears Cynthia Kaufman, Colorado's Attorney General, called for a non-federal independent review of this matter. Is that correct? Are you aware of that?

Hon. BENN. No, I'm not aware of that.

Mr. BRIDENSTINE. Well, that indicates that that's her intention. In your testimony, you state that the EPA region 9 tour guide was with you on your site visit. Is that correct?

Hon. BENN. Yes, sir.

Mr. BRIDENSTINE. You further stated that it appeared during your visit to the mine site that it was the first time an EPA region 9 official had visited the location. Is that to your recollection?

Hon. BENN. Yes. When we were—we were actually one of the first ones up there. There wasn't too many other jurisdictions that had access to it. We kind of, you know, bogarted our way up there, and because EPA told us that water was clear.

Mr. BRIDENSTINE. Right.

Hon. BENN. And we wanted to make sure, and when we got up there, obviously it wasn't.

Mr. BRIDENSTINE. Well, that was my next question here. You noted that yellow water was still exiting the mine at the time of your visit. Can you tell us a little bit more about what you saw in regards to the water still exiting the mine?

Hon. BENN. It was still mustard orange, and we did see where they had put in the ponds, and then we saw how they were treat-

ing it with sodium hydroxide and a fluctuant actually that captures the metals, and we saw that on the day that we were up there.

Mr. BRIDENSTINE. And this was all coming from the mine at the time?

Hon. BENN. Yes, sir.

Mr. BRIDENSTINE. This is a question for my good friend from New Mexico, Steve Pearce. He says that in New Mexico, about 60 percent of the total surface water is in this watershed. The Navajo Nation is at ground zero as well.

Mr. Stanislaus, is the problem going to be cleaned up in New Mexico? Is it now? It is going to be cleaned up?

Hon. STANISLAUS. Yeah, so we have worked with the State of New Mexico and other States and the Navajo Nation. So we provided data, and we've concluded the data has shown that it's been restored to pre-incident conditions. But there is a long-term solution. There's lots of discussions by stakeholder groups about potential of Superfund and other vehicles. So as I identified in my opening statement, there is a load from mine, a lot of mines, about 330 million gallons per year, and the Animas River Stakeholders Group identified that concern as well as the State of Colorado as something—as there is a need for a long-term solution.

Mr. BRIDENSTINE. So can my friend, Steve Pearce from New Mexico, go home and tell his constituents that the drinking water is safe? Can he do that in good conscience right now?

Hon. STANISLAUS. Yes. I mean, what we've communicated with the State of Colorado—I'm sorry—the State of New Mexico is that the water has returned to pre-incident conditions.

Mr. BRIDENSTINE. I yield back.

Chairman SMITH. Thank you, Mr. Bridenstine.

We have no other Members with questions so let me thank all of our expert witnesses today for their testimony. This has been a very informative hearing, and I think you've heard from Members on both sides of the aisle their keen interest in the EPA cleaning up the problem, making sure that it doesn't happen again, and looking forward to the conclusion of the investigation because we do want someone to be held accountable, and we want the EPA to take responsibility.

Thank you all, and we are adjourned.

[Whereupon, at 12:10 p.m., the Committee was adjourned.]

Appendix I

Additional Material for the Record

1570601 - R8 SDMS

Task Order Statement of Work
EPA Region 8 ERRS Contract No. EP-S8-13-02
Environmental Restoration, L.L.C.
06/25/14

Name: Gold King Mine
Task Order No. 051

On-Scene Coordinator: [redacted]

Site Name: Gold King Mine
Superfund Site ID (SSID): 085M (OU01)
Federal Project Number (FPN): Not Applicable
City/County/State: Twp. 42N, R7W, NMPM, San Juan County, Colorado

Removal Type: Time Critical Removal
Funding Source: Removal Assessment
Anticipated Start Date: 07/07/2014
Anticipated End Date: 12/01/2014

The conditions at the Gold King Mine present an endangerment to human health and the environment and meet the criteria for initiating a removal action under 40 CFR section 300.415(b)(2). All activities directed by EPA's On-Scene Coordinator must remain consistent with The National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300).

Background

The Gold King Mine location in Twp. 42N, R7W, NMPM, San Juan County, Colorado is characterized by a mine discharge that is a significant contributor of manganese, copper, zinc and cadmium into the Cement creek drainage of the Animas River watershed.

The Gold King Mine has not had maintenance of the mine working since 1991, and the workings have been inaccessible since 1995 when the mine portal collapsed. This condition has likely caused impounding of water behind the collapse. In addition, other collapses within the workings may have occurred creating additional water impounding conditions. Conditions may exist that could result in a blow-out of the blockages and cause a release of large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals.

The Division of Reclamation, Mining and Safety (DRMS) performed work under a bond to stabilize the existing adit opening to allow mine water drainage. The flow exits the mine through a culvert pipe and enters a concrete flume on the waste dump surface and flows to half pipe culvert eventually discharging to the North Fork Cement Creek. The existing conveyance channel shall be protected and maintained during the work. If it becomes necessary to remove these drainage features, then suitable measures must be installed to control flows during the work. A replacement conveyance system is required to be installed after the portal and

underground work are completed.

It is proposed to re-open the Gold King Mine portal and workings to investigate the conditions to assess the on-going releases. This will require the incremental de-watering and removal of such blockages to prevent blowouts. The work is intended to take place in September-October, 2014.

In addition, the secondary purpose of the work is to attempt to identify and characterize specific water flows into the mine and evaluate potential means to mitigate those flows if possible.

Objectives

The work will be conducted by qualified contractors with the assistance and cooperation of the landowner, San Juan Corp. In addition to compliance with applicable OSHA standards, the work is to be conducted in compliance with appropriate Mine Safety and Health Administration (MSHA) regulations inclusive of establishing a safe underground working environment for personnel and the rehabilitation of underground workings and escapeways. (Note: MSHA regulations are not applicable to inactive mines; however certain standards are relevant to the propose work.)

All work will be performed under the conditions as described in an approved Work Plan to be submitted to the OSC for approval that will be prepared by the Contractor and submitted to the Agency before mine rehabilitation work begins.

The purpose of this Removal Work is to complete the following tasks;

Site Preparation:

Roadways and staging areas will be prepared to allow for safe access to the work area for heavy equipment and vehicles. Building debris and structural hazards will be removed or secured to eliminate physical hazards associated with such.

Water management systems will be set up and operational before any construction work begins. Initial measures must include standard best management practices (BMPs) for stormwater run-off along roads requiring improvement. Mine water management is required to prevent additional impacts from release during performance of work under this scope. Appropriate plans to manage the water must be developed and included in the work plan.

Portal Rehabilitation:

Engineering specifications and geotechnical assessment of the structural requirements to stabilize the portal structure and underground support systems must be provided. The appropriate engineered specifications must be developed including typical designs for structural support systems (e.g., steel sets, and arch supports and timbers), identify the materials and construction requirements for structural supports. In addition, specify the anticipated approach for removing overburden, debris and re-establishing a safe structure that can be used for entry and egress and

secured when not in use. This includes installing a portal gate with a secured locking system.

Measures will be taken to control water and metal precipitate sludge and sediment that are impounded behind any blockage at the portal or in the mine. This will include the treatment of surge water discharge as necessary to prevent an uncontrolled release and impact to surface water.

Underground Work:

Adit rehabilitation includes removing the collapsed structures and colluvial overburden blocking the historic adit opening. This must be performed by an experienced contractor with required mine safety training for working underground. Standard measures for communication, ventilation and power will be provided for crews as necessary.

Collapse blockage material removal will be performed in a controlled manner in odor to control the rate of release of water and allow for appropriate treatment and sludge management. This is to include the ability to pump water from behind the blockage and lower the water level in a controlled manner before the blockage is destabilized by removal of material.

This scope includes the plan to rehabilitate as far in as 75 feet inby of the portal opening. Underground conditions are uncertain, and the amount of blockage is not known. The initial objective is to establish a portal shed structure for safe access to the underground workings and continue rehabilitating the workings as needed for 75 feet, if this is determined possible. Beyond that point, a determination will be made as to what additional work is required to allow safe access into the mine. As determined appropriate by the OSC, work may continue on an incremental basis to install the necessary structural supports as specified.

All materials and equipment necessary to implement this work will be present on site and inspected before operations are initiated.

Water Treatment:

A temporary water retention and sludge management pond must be prepared and operated, as necessary, on site to manage mine water and sludge removed from the adit. This will be used to manage impounded mine water and base flows and metal precipitate sludge from the mine workings during the construction activities. If necessary, water treatment may include pH adjustment and flocculent to assist precipitation/settling of elevated metals levels to meet existing water quality in the discharge from the mine. (The START contractor is responsible for overseeing the water treatment operations and for all environmental data, including sampling, associated with the water treatment objectives and activities.)

Site Stabilization:

The site work area must be graded and appropriate erosion control measures must be in place

before demobilizing. This will include appropriate BMPs for construction site stormwater controls and post construction stabilizations. These are to be specified in the Work Plan submitted to EPA.

Reporting

A final report is required to include a description of the work performed with detailed information on the distances underground accessed and the number of structures installed. A description of all materials used in the support structures and quantifies of material removed and locations where it is placed are required. List all the equipment use and personnel involved in the operation. A description of the water management system is also to be included. The report is to be provided within 60 days of demobilizing.

Data Requirements

All environmental data including site characterization and waste characterization, mitigation, and disposal that is collected, generated, and used will be documented by the START 4 contractor in accordance with the Weston Quality Management Plan (QMP) Sections 2.3 and 7.0 (May 2013). The ERRS contractor will not be gathering the environmental data.

Hazardous categorization of wastes? No.

Activities Under Contract Statement-of-Work: The contractor shall accomplish the following tasks as required under the Contract:

1. Project Planning (SOW II.A.I)

   - Provide a detailed work plan to accomplish the project in the most effective, efficient and safe manner based on existing information. This work plan shall, at a minimum, define the types and quantities of cleanup personnel, equipment and materials that will be needed, the proposed project schedule by sub-task, and the estimated cost.

   - Provide a detailed Health and Safety Plan to protect the workers on-site from the hazards with the contaminants and physical threats associated with the removal actions.

2. Containment, Countermeasures, Emergency and Removal Response (SOW II.A.2)

   NA.

3. Decontamination, Response Mitigation (SOW II.A.3)

   - Provide for appropriate removal of contamination if appropriate, in consultation with the OSC.

4. Treatment and Transportation and Disposal Operations (SOW II.A.4)

- Provide for appropriate disposal and transportation of all contaminated debris, if appropriate. Treatment of the water may be required, however will be overseen and managed by the START contractor.

5. Restoration and Soil Stabilization (SOW II.A.5)

- Provide for appropriate refurbishment of affected areas, as appropriate and in consultation with the OSC.

6. Analytical Services (SOW II.A.6)

- NA.

7. Demolition Services (SOW II.A.7)

- N/A

8. Construction and Support Facilities in Support of Removal Actions (SOW II.A.8)

- Provide for office trailer, including support equipment, communications, power, as needed.

9. Marine Operations (SOW II.A.9)

NA.

10. Trans-boundary Response (SOW II.A.10)

NA.

11. Response Times (SOW II.A.11)

NA.

12. Regional Cross-Over (SOW II.A.12)

NA.

Deliverables

Detailed Work Plan	08/22/2014
Health and Safety Plan	NLT the Date of Mobilization
Construction & Implementation	N/A
Daily Work Orders	Daily
Daily Cost Summary Reports (55s)	Daily
Removal Activities Report	NLT 30 days after Demobilization
Final Daily Cost Summary Report (55s)	NLT 90 days after Demobilization

Schedule

The work plan preparation is expected to begin on July 7, 2014, and the current estimated schedule is to begin work onsite is September 3, 3014. A work plan must be submitted to EPA by August 22, 2014. The Task Order expiration is set for December 1, 2014.

Other Task Order Requirements

1. Provide for application of Service Contract Act Labor rates and David-Bacon Labor rates in consultation with the R8 ERRS Contracting Officer.

2. Provide all site cost documentation within 90 days after demobilization date, with the exception of 'pending costs.' Use RCMS Windows Version 2.0 for Site cost accounting purposes.

1573795

Environmental Restoration

ENVIRONMENTAL RESTORATION, LLC
ACTION / WORK PLAN

PROJECT NAME:	Gold King Mine
PROJECT JOB NO:	GK8-51
PROJECT LOCATION:	Silverton, CO
CONTRACT NO.:	EPS81302
TASK ORDER NO.:	51
DATE:	MAY 2015

1.0 SITE BACKGROUND

The Gold King Mine near Silverton, Colorado is a historic gold mine at approximately 11,300' elevation. The mine includes a year around discharge that is a significant contributor of manganese, copper, zinc and cadmium into the Cement Creek drainage of the Animas River watershed. The Gold King Mine has not had maintenance of the mine working since 1991, and the workings have been inaccessible since 1995 when the mine portal collapsed. This condition has likely caused impounding of water behind the collapse. In addition, other collapses within the workings may have occurred creating additional water impounding conditions. Conditions may exist that could result in a blow-out of the blockages and cause a release of large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals.

It is proposed to re-open the Gold King Mine portal and workings to investigate the conditions to assess the on-going releases. This will require the incremental de-watering and removal of such blockages to prevent blowouts. The work is intended to take place in late Summer or Fall, 2015. In addition, the secondary purpose of the work is to attempt to identify and characterize specific water flows into the mine and evaluate potential means to mitigate those flows if possible.

2.0 SCOPE OF WORK

The project work includes improving site access, grading the top of the dump as a work area, directing mine discharge to the pond at the Red and Bonita work site, establishing a water treatment system, removing the material covering the adit, installing a new portal structure and rehabilitating the adit as directed by the OSC. Upon completion of activities the site will be stabilized with the discharge solely directed to its original drainage.

3.0 OPERATIONAL APPROACH

The following sections discuss ER's approach to the execution of the Task Order Statement of Work tasks. Significant tasks are identified with details on how ER will accomplish the SOW requirements. Whenever practical ER will perform concurrent tasks and share resources (both equipment and personnel) with TO62.

3.01 PRE-MOBILIZATION ACTIVITIES

ER will prepare the following plans for submittal, review and acceptance by the US Environmental Protection Agency prior to site mobilization.

- ✓ Work Plan (contained herein)
- ✓ Cost estimate (Attachment A)
- ✓ Project Schedule (Attachment B)
- ✓ Site Health and Safety Plan (HASP) (attachment C)

ER has begun solicitation and procurement efforts to initiate the commencement of on-site operations. The following is an initial list of items to be identified and addressed prior to mobilization;

- ✓ Local authorities, property owners, and mine claim holders will be contacted and informed of site operations and schedule [OSC function –ER will support as requested]
- ✓ Coordinate with respective utilities on clearances/locates to ensure safe Site work zones
- ✓ Lodging, Equipment and material sources will be identified and tentatively scheduled
- ✓ An underground contractor will be procured for underground work and mine construction specific tasks such as portal installation and stabilization of the brow

3.02 MOBILIZATION

Mobilization will occur from ER's Denver office and shall consist of the Site Removal Team. The Removal Team shall consist of the Response Manager (RM), foreman equipment operator, and two laborers. The initial mobilization will include site preparation and set-up activities including the mobilization of required site equipment and materials identified to complete the startup of the project. A complete estimate of equipment, materials and supplies required for the project that are outlined in section 4 (Resources) below.

ER will mobilize additional personnel, equipment, and materials as warranted by site tasks/operations. The RM will directly coordinate with the OSC in determining resources required to perform the identified tasks.

3.03 PHASE 1 SITE PREPARATION

Site preparations will occur as possible during work on the red and Bonita to expedite mobilization of the Gold King subcontractor. Tasks included in Site Preparation are:

- HASP review with site crew
- Restore access road
- Grade portal work area to allow drainage to North
- Drop grade of dump to allow access to adit floor
- Use removed material to create manlift access ramp to area above portal
- Install drainage hose/pipe from the North end of the Gold King dump that proceeds down slope westward to the Red and Bonita settling pond. This effort will involve widening the access road from the last switchback to the portal to allow access by vehicles and heavy equipment, and installing a combination of durable lay-flat hose, PVC and aluminum (if pH adjustment occurs prior) pipe to convey the AMD from the N end of the Gold King to dump to the settling pond at Red and Bonita. The conveyance system will be anchored along its path and inspected daily.

3.04 PHASE 2 PORTAL INSTALLATION AND ADIT REHABB

The underground subcontractor [redacted] will be mobilized to provide expertise in mine site related activities. ERRS will support [redacted] by providing earth moving equipment, operators and laborers as necessary for outside operations. It is not anticipated that ERRS personnel will provide underground work other than carrying in supplies as necessary and only under supervision of someone qualified to identify underground hazards. The ERRS team will comprise the OSHA required 5 person rescue team during underground operations. Tasks planned for [redacted]/ERRS after mobilization include:

- Utilize ramp created in site set up to access slope above portal

[redacted]

- Excavate loose material from the top of the high wall.
- Drill in wire mesh anchors.
- Hang wire mesh on the high wall as excavation to the sill of the portal proceeds.
- Excavate to the sill and into the competent rock face at the portal.
- Gradually lower the debris blockage with the appropriate pumping of the impounded water to water management/treatment system (at Red and Bonita and described in TO62 Work Plan), to prevent the uncontrolled release of mine water. If possible a 4" steel stinger will be inserted through the blockage to lower the mine pool prior to any removal.
- Install bedding material for a 20' length of 10' diameter culvert section.
- Install an estimated 20' length of 10' diameter culvert section.
- Install a drain pipe(s) below the portal culvert. The drain will be sized for a minimum capacity of 200 GPM. It will be extended into the adit as necessary to keep the steel sets dry.
- Seal the culvert at the rock face.
- Grout around the portal pipe and brow/adit connection as directed by OSC
- Backfill the portal over the top with 2' of material back 5' from the rock face, and 5' high on both sides for 15' lateral. Non-mineralized material will be used against the pipe.
- Install utilities for underground operations during construction including 2" air line for drilling, a 2" water line for drilling, 2" discharge line for removal of mine water, a 120 VAC power line for lights and small tools, a 480 VAC power line for pumps to control mine water when needed, and if required a 12" ventilation line. All electrical requirements will be supplied by a 100 KW portable generator. A mine phone communication line will also be installed if required.
- Build access road for tunnel mucker.
- Support the brow at the portal.
- Muck and rehab 100' in-by the portal, as determined appropriate by the OSC.
- Install a locking double adit door closure 8'Hx8'W adapted from DRMS Standard drawings #5 and #7.
- Return flow to original path, construct flume and measuring station as directed by OSC
- Remove drainage system from hillside to Red and Bonita
- Remove equipment and debris from site
- Reinstall gully on access road suitable for Spring runoff
- Demobilize personnel and equipment

4.0 RESOURCES

The following table identifies the different resources ER will employ to complete the SOW elements.

PERSONNEL	QUANTITY	COMMENTS
Project Manager	1	[redacted]
Foreman	1	[redacted]
Equipment Operator	1	TBD
Laborers	2	TBD
Truck Drivers	1	As necessary for supply delivery
Field Clerk (offsite)	1	TBD
EQUIPMENT	**QUANTITY**	**COMMENTS**
Truck, P/U	3	ER owned -mobe Denver

Mobile storage placed at Gladstone	1ea	Rental-competitive procurement through local / regional sources
Piping – rental layflat or aluminum	2000 ft	
Excavator shared with TO62	1	Rental-competitive procurement through local / regional sources
6" diesel pump shared with TO62	1-2	Rental-competitive procurement through local / regional sources
Front End Loader shared with TO62	1	Rental-competitive procurement through local / regional sources
Finish Grade Dozer if necessary	1	Rental-competitive procurement through local / regional sources
OFCs	**QUANTITY**	**COMMENTS**
Trash Service	TBD	Competitive procurement through local sources
Lodging	TBD	Lodging at local Hotel
Bulkhead Subcontractor	TBD	Competitive procurement
Underground Contrcator	1	[redacted] Selected through competitive procurement that included local sources
Portable Toilets	4ea.	Competitive procurement through local sources

5.0 OPERATIONAL COSTS

Contained in Attachment A

6.0 SITE SCHEDULE

Contained in Attachment B

ATTACHMENT A

Cost Estimate

ATTACHMENT B

Schedule

ATTACHMENT C

Health & Safety Plan

Internal EPA Summary Report

SUMMARY REPORT

EPA Internal Review of the August 5, 2015 Gold King Mine Blowout

8/24/2015

Purpose:

The purpose of this report is to provide the EPA Internal Review Team's (Team) assessment of the events and potential factors contributing to the blowout from the Gold King Mine (GKM) in Colorado on August 5, 2015. This report provides the Team's observations, conclusions, and recommendations that regions may apply to ongoing and planned site assessments, investigations, and construction or removal projects at similar types of sites across the country.

Team Charge:

The Assistant Administrator of the Office of Solid Waste and Emergency Response (OSWER) charged a subgroup of the National Mining Team on August 14, 2015 to conduct a rapid analysis of the Gold King Mine (GKM) release and provided them with the following charge:

The EPA Gold King Mine Internal Review Team (Team) is charged with conducting an internal review of the August 5, 2015, release of approximately 3,000,000 gallons of mine wastewater from the Gold King Mine near Silverton, CO. This review will entail developing a detailed, chronological description of events as well as identifying potential factors contributing to the release. The review may include recommendations that regions may apply to ongoing and planned site assessments, investigations, and construction or removal projects. The review will include:

- *A visit, during the week of August 16, 2015, to the Gold King Mine site to observe post-August 5 site release conditions.*
- *Interviews with the on-site EPA On-Scene Coordinator and other appropriate EPA staff, appropriate contractor representative(s) (e.g., Emergency Response and Rapid Services [ERRS], Superfund Technical Assessment and Response Team [START] contractor), and others, e.g., State, other Federal agency/departmental personnel, as appropriate, to document their recollections of the event. Interviews shall not interrupt response.* [See Attachment B for a list of people interviewed.]
- *Interviews to be conducted using guidelines to be included in a briefing from the Office of the General Counsel.*
- *Review of pertinent site documentation, (e.g., work plan, schedule, quality assurance response form, other pertinent technical/engineering/contractual documents/any photographic records) to identify potential factors contributing to the release.*

- *Potential coordination with the subsequent external review being conducted by the US Department of Interior/Bureau of Reclamation and US Army Corps of Engineers thereby minimizing the impact to response operations.*
- *Any recommendations to implement at similar sites, both ongoing and new, based on the results of the Team's review.*

A senior manager from OSRTI will be identified to facilitate the identification of individuals to be interviewed, agencies to engage, etc. The Team will develop a preliminary report addressing the information above and deliver it electronically to the OSWER Assistant Administrator by Monday, August 24, 2015. If necessary, the team may also indicate if additional gaps need to be filled, and the timeframe it would take to fill those gaps.

Scope of Team Review:

The Team was asked to conduct a one week rapid assessment of the GKM Blowout. From August 15 to August 24, 2015, the Team performed a site visit, interviewed key individuals, reviewed available information, and drafted a report.

EPA's Internal Review Team consisted of the following: individuals:

John Hillenbrand, CEG, EPA Region 9 – Team Leader
Joshua Wirtschafter, Assistant Regional Counsel, EPA Region 9
Ed Moreen, P.E. Civil, EPA Region 10
Lisa Price, Geologist, EPA Region 6
Shahid Mahmud, Environmental Engineer, EPA Headquarters

The following are the attachments included in this report:

Attachment A: List of documents reviewed by the Team
Attachment B: List of interviewees
Attachment C: Map of Mine Workings
Attachment D: Working Assumptions Diagram of conditions at new Gold King Mine Level 7 Portal
Attachment E: Gold King Mine Flow Data and Chart
Attachment F: Report Photos
Attachment G: Photo log from 2014 and 2015 Removal Investigation activities

In addition, the Team conducted a limited review of internet resources to determine if there are existing guidelines or procedures for investigating sites with similar characteristics as this site.

Background Information:

The following is the chronology of pertinent site events.

1880's – The Gold King Mine began operation.

Mid-1900's – The Gold King Mine operations ceased; mining had occurred at seven (7) different elevations (levels) through three (3) adits: the Level 7, Number 1, and Sampson. Historical mine water levels could not be ascertained by the team during the review period.

Mid-1900's -- The American Tunnel was constructed below the lowest mine workings in the area (Attachment C: Map of Mine Workings). It runs from the drainage adit discharge point in Gladstone, beneath the Gold King Mine and eventually reaches the Sunnyside mine complex approximately two (2) miles northeast. During operation of the American Tunnel it effectively drained the Gold King and Red and Bonita Mines. It passes 500 feet directly beneath the Gold King Mine Level 7 adits. Anecdotal information puts construction in the early to mid-1900's. A treatment plant was constructed to treat the water from the tunnel prior to release to Cement Creek. The date of construction of both the water treatment plant and the American Tunnel could not be ascertained during the review period.

1986 – A permit was issued to the Gold King Mines Corporation (Permit Number M-1986-013) by the state of Colorado to re-work the historic interconnected adits. During the permitted mine operations, another adit was driven at the Gold King Level 7 (the Adit) to bypass a collapse in the original Gold King Level 7 Adit (the Old Adit).

2002 – Treatment of the discharge water from the American Tunnel ceased after installation of the last bulkhead. Flow from the American Tunnel continued after the installation of the bulkhead at approximately 100 gallons per minute (gpm). Since closure of the American Tunnel, the water quality in the Animas River has degraded progressively due to the impact of drainage from the American Tunnel and other newly draining adits.

2005 – No documentation of flow for the Adit is available before July 2005. Anecdotal information suggests that the Red and Bonita Mine, which did not have any previously documented mine water discharge, began releasing approximately 300 gpm of water after the American Tunnel closure. The Adit also experienced an increase after the American Tunnel closure from no significant flow to flow rates of approximately 42 gpm in July and 135 gpm in September[1]. (See Attachment E: Gold King Mine Flow Data and Chart)

2006 – Mine water flow rate from the Adit was approximately 314 gpm[1] in October.

2007 – Release of mine water from the Old Adit breached the existing discharge ditch and saturated the mine waste pile. The saturated conditions led to a slope failure that partially blocked access to the site and filled the North Fork of Cement Creek with mine waste. The quantity of mine water discharged is not known.

[1] The Team could not ascertain in the time allowed if flow rates represent composite for both the Old Adit and the Adit or just the Adit

2008 – The Colorado Division of Reclamation, Mining & Safety (DRMS) constructed a discharge diversion structure (flume channel) to prevent future mine water saturation of the Gold King Level 7 mine waste pile at the Old Adit. This work was paid for by the forfeiture of the bond associated with the permit issued in 1986, M-1986-013.

2009 – The DRMS's Gold King Mine Reclamation Plan called for all four (4) adits of the Gold King complex to be backfilled and the installation of a flume to divert the discharge. The two (2) Gold King Level 7 adits (Adit and Old Adit) were partially collapsed already but additional closure work was conducted. This work was paid for by the forfeiture of the bond associated with the permit issued in 1986, M-1986-013. DRMS stated in the project summary for the activities that "[a] future project at the site may attempt to cooperatively open the Level 7 Old Portal in an effort to alleviate the potential for an unstable increase in mine pool head within the Gold King workings." The Old Adit was releasing roughly 200 gpm.

2010 – The average mine water flow rate from the Gold King Level 7 mine was 206 gpm[1].

2011 – The average mine water flow rate from the Gold King Level 7 mine was 140 gpm[1].

2014 – EPA planned to expose the Adit in 2014 – EPA was working with DRMS and the Animas River Stakeholder Group (ARSG), which is composed of industry, agency and citizens including former miners and equipment operators who have worked on some of the mine adit closures in the area of Gold King, to identify actions that may be needed to reduce contaminant loading to Cement Creek and downstream waters. This included a plan to install bulkheads at the Red and Bonita Mine. It was determined appropriate to attempt to open the Adit prior to restricting flow at the Red and Bonita Mine with a bulkhead and potentially changing the water level elevations in the Red and Bonita Mine. To accomplish this objective, EPA planned to expose the Adit behind the external blockage, build a portal structure, and convey Adit flows into the existing channel (see Attachment D). This was being done to allow access for further investigation of the Adit. The flow rate data from the Gold King Level 7 mine was approximately 112 gpm in August, 2014, however, on September 11, 2014 prior to the beginning of site work, the flow rate was less than 13 gpm.[1]

A retention pond was constructed to capture solids that might be released during the Adit work. On September 11, work began to remove the material that was blocking the Adit. The excavation extended approximately 20 feet into the Adit entrance. The work stopped when it was determined that the elevation of the Adit floor was estimated to be six (6) feet below the waste-dump surface elevation. EPA determined that Adit drainage would need to be managed in a larger settling pond(s) requiring additional treatment.

The excavation in 2014 revealed that two (2) 24-inch pipes were in the tunnel blockage adjacent to the top (roof) of the maximum 10 foot tall Adit. (See Diagram in Attachment D). The presence of water below the two (2) 24-inch pipes indicated the current flow of water was coming out at least four (4) feet below the roof of the Adit, indicating approximately six (6) feet of impounded water above the estimated Adit floor elevation.

On September 12, two (2) drain pipes were placed at the base of the blockage to capture the on-going mine water drainage and direct flow into the existing flume channel installed in 2008 by DRMS. Geo-fabric, crushed rock, and quick-dry concrete was used to secure the pipes in place. The Adit area was backfilled and compacted with additional loads of crushed rock to maintain a stable surface at the Adit for potential future work. Field work was suspended for the rest of the year.

2015 – Based on information acquired in 2014, EPA, again, planned to reopen the Adit and workings to investigate the conditions to assess the ongoing releases of mine water. This would require incremental de-watering and removal of internal blockages that were preventing the release of impounded water. A secondary purpose of the work is to attempt to gain access to the mine workings and to mitigate flows, if possible.

In January and May, 2015, the ARSG held meetings, open to the public, where DRMS and EPA presented their plans for removal investigation at the Adit. The Meeting Summaries posted by ARSG do not record any stakeholder criticism of the planned approach.

EPA returned to the Adit in late July, initiating site preparations with reconstruction of the access road and installation of an alternative mine drainage pipe at a deeper depth in anticipation that the Adit floor is lower than the other drainage pipes installed in 2014.

On August 4, excavation began above the top of the Adit to remove consolidated soils and debris. The goal was to find competent bedrock within which to anchor a support structure for the Adit. During this first day of excavation, according to the OSC, mine timbers and the external Adit blockage were newly exposed

On August 5, excavation resumed. The OSC observed a solid rock surface and constructed a ramp above the external Adit blockage to remove soil from the bedrock surface. During the excavation, the lower portion of the bedrock face crumbled away and there was a spurt of water from the area in the lower part of the excavation area. Shortly after the water spurted, more water started coming from the localized area of the spurt. The color of the water was initially clear but then changed to red/orange. The OSC speculated that the excavation might have knocked something lose when removing the soils from the rock face.

The time lapse between the spurting to the flow of red/orange water was 3 to 4 minutes. It took approximately 1 hour for the peak flow to subside.

Observations Related to the Release:

The Team interviewed key personnel involved with the Adit blowout from EPA Region 8 on August 17, 2015, to document their recollections of the event and to get pertinent site documents and other information on the site. EPA Region 8's personnel provided a package of key site-related documents, pictures of the site, and site diagrams. On August 18, 2015, the lead OSC from Region 8 led a site visit of the Gold King Mine. Senior mining experts from the DRMS also participated in this site visit. The Team asked the State experts about their understanding of the site and recollection of the events at the Adit and the upper Animas River mining district.

The August 18 tour included stops at: the American Tunnel entrance with an explanation of the underground working by DRMS; the road above the series of ponds that treat the post-blowout drainage from the Adit (see Appendix F, photo 1); the Gold King Mine area; and both the Old Adit and the Adit. No stop was made at the Red and Bonita Mine (Appendix F photo 2 and Attachment C, map of workings).

In addition to bringing an understanding to the chronology of events listed above, the site visit and work plan provided the following supplemental information:

- The work plan accounted for the possibility of pressurized (mine water with a head high enough to cause water to exit the Adit at high velocity) mine water conditions. In the introduction, the work plan states:

  > "Conditions may exist that could result in a blow out of the blockages and cause a release of large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals."

- The work plan outlined the steps to be taken such as gradually lowering the debris blockage and the use of equipment (stinger) that would help control drainage from the mine under non- or slightly pressurized conditions. A stinger is a metal pipe that is inserted from above the top of the mine adit front at an angle, through the debris and collapse blockage into the void behind the blockage, allowing drainage and control of mine water.

- For the Adit, a determination of no or low mine water pressurization was made by experienced professionals from EPA and the DRMS. Based on discussions with the EPA and State people associated with the site, this determination was based on the following conditions:

  1. The hill above the Adit was inspected for seeps which would have indicated outward flow from mine water that had a pressure head above the top of the Adit. It was reported that there were no seeps.
  2. The mine was draining, which indicated that since water was able to escape, buildup of pressure was less likely.
  3. The DRMS experts, (b) (6) [redacted] who supported the removal investigation, had worked in the area for years, were familiar with the site and knew the details of the operation and area hydrology
  4. The Animas River Stakeholders Group (ARSG) had been given a presentation by (b) (6) [redacted], EPA's On-Scene Coordinator (OSC), and (b) (6) [redacted] with DRMS, as documented in the May ASRG Meeting Summary.
  5. The DRMS experts supported the removal investigation at the Adit and were present at the site during the operations on August 4 and 5.
  6. The "seep" level coming from the Adit during excavation seemed to be at the mid-level of the material blocking the Adit, indicating a partially filled adit as opposed to a pressurized one (See Attachment D, bottom of two metal pipes).

7. The Red and Bonita Mine Adit was lower in elevation (a few hundred feet) and found to be unpressurized after it was accessed by drilling from above.
8. The DRMS experts indicated that similar techniques have been employed at other similar mine sites. One DRMS expert noted that a similar investigation technique was implemented at the Captain Jack Mine in Colorado but did not result in a blowout.

- Despite the available information suggesting low water pressure behind the debris at the Adit entrance, there was, in fact, sufficiently high pressure to cause the blowout. Because the pressure of the water in the Adit was higher than anticipated, the precautions that were part of the work plan turned out to be insufficient. The inability to obtain an actual measurement of the mine water pressure behind the entrance blockage seems to be a primary issue at this particular site. If the pressure information was obtained, other steps could have been considered. However, the Team cannot determine whether any such steps would have been effective, or could have been implemented prior to a blowout.

- Mine water pressurization data from behind the blockage potentially could have been obtained through a drill hole inserted further back into the Adit from above the mine tunnel. Such a technique was performed at the nearby Red and Bonita Mine and found no pressurization. Consequently, it was determined that the tunnel was not full of water and excavation of the Adit at that mine could proceed. Such a technique was not used at the Adit. Based on the site topography (steepness and ruggedness) observed by the Team and conversations with the OSC and the DRMS experts, (See Attachment F, first photo) the use of such a technique would have been very difficult and expensive at the Adit. The unstable and steep slope above the Adit had loose soils and rock and the underlying bedrock was prone to cave-ins, as observed over the nearby Old Adit (See Attachment F, photo 3). Because of the soil and rock conditions, the access and drilling of a hole into the Adit from above would have been quite costly and require much more planning and multiple field seasons to accomplish. Although difficult and therefore expensive and technically challenging, this procedure may have been able to discover the pressurized conditions that turned out to cause the blowout.

- An additional potential clue of potential pressurization was the decrease in flows from the Gold King Adits over the years (Attachment E). That decrease could have been an indication of impounded water from a blockage. The mine drainage flow before 2005 was understood to be zero and increased from 42 gpm in 2005 to 135gpm in September 2005 and peaked at 314 gpm in October 2006. This increase is attributed to rising groundwater in the Gold King Mine workings from plugging of the back portion of the American tunnel in 1995 and possibly 2002. The average flows in 2010 dropped to 206 gpm, further dropped to an average of 140 in 2011 and finally to about 70 gpm or less in the past year. These conditions may indicate some type of internal change to the mine such as additional cave-ins, or a restriction due to already caved material, perhaps by chemical precipitates, or some other cause. It is also possible that the reduced flows could have been attributed to decreased precipitation in the area or increased flows from the American Tunnel.

- The Team was not able to identify any calculations made on the possible volume of water that could be held behind the portal plug. This calculation could have been useful in determining possible response scenarios for unexpected releases.

- The Request for Proposals (RFP) that included the work at the Adit project requested a plan for dealing with mine water flow and also states that the blockage in the Adit must be removed in a manner to prevent a surge of impounded mine water from being released. It called for the water impounded behind the blockage to be drawn down in a controlled manner as the blockage is removed. Upon review of the work plan, the contractor provided a description and conceptual drawing for dealing with the water (Attachment D). However, the Team believes that Emergency Action Plan (EAP) included with the site plan did not anticipate or plan for the volume or pressure encountered and contained only limited emergency procedures in case of a mine blowout. This lack of information about a blowout in the EAP could indicate the low expectation of its occurrence by the contractor and reviewers. These procedures and contacts may have been included in the Site Health and Safety Plan but this document could not be obtained in time for this report.

Conclusions:

Based on the review of the available information, including the interviews, documents and site visit, the Team is providing the following conclusions:

1. The EPA site removal investigation team had extensive experience with the investigation and closure of mines. The EPA site removal investigation team had consulted with and had the field support of the DRMS. The EPA site removal investigation team also performed outreach to the ARSG, to provide an opportunity for additional input regarding the planned activities. The EPA site removal investigation team and the other entities consulted or who provided information about the proposed activities had extensive site knowledge of the mine workings and extensive experience evaluating and working on mine sites. None of those participating or informed parties raised any significant concerns with the proposed activities.

2. In preparation for the investigation activities, EPA had collected and analyzed flow data, was familiar with site topography, and had inspected the site for signs of seeps, including the area above the Adit, prior to implementing the execution of the work plan.

3. It is not evident that the potential volume of water stored within the Adit had been estimated. Given the maps and information known about this mine, a worst case scenario estimate could have been calculated and used for planning purposes. When adequate information is available, performing such calculations may aid the site management team in instances where water is anticipated to be trapped in an adit. The interconnectivity of

mine workings could be used to estimate potential water volume prior to opening up a collapsed adit.

4. Additional expert opinions may be warranted for sites with collapsed adits, complex interconnectivity of mine workings, and highly transmissive bedrock groundwater systems.

5. The work plan contained an EAP which included provisions for mine emergencies including cave-ins. However, based on the documents reviewed by the Team, it was lacking emergency protocols in the case of a significant flow or blow out. It should be noted that the site team responded appropriately during and after the blowout by moving personnel and equipment and diverting mine water discharge. Such provisions are an important component of an EAP on sites such as the Gold King Mine. There may have been some contingencies planned in case of a blowout, but it could not be ascertained by the Team during the review period.

6. The Adit is located in a remote, rugged mountain location in the Rocky Mountains. The level of effort necessary to mobilize a drill rig and create a drill pad to undertake drilling or other investigative techniques to determine pressure (hydrostatic head) within the mine would require significant resources and add additional time to the implementation schedule and may not be successful in ascertaining water levels or pressure within the mine. Safety is a key consideration for drilling at the Gold King site, and establishing a safe location for the drill pad would be very challenging given the steepness and instability of the slopes above and in proximity to the Adit. Drilling to hit a target such as an adit or tunnel can be very challenging if the drill pad cannot be located in close proximity the adit entrance. It can also be a lengthy process and require considerable effort and expense. However, if it could be performed successfully and safely, drilling could provide the information needed to ascertain the pressure behind the collapsed workings within the mine.

7. In reviewing the pertinent documents provided, interviews conducted, visiting the site and evaluating the photo logs, the Team concludes that the Adit blowout was likely inevitable. Actions taken by the EPA OSC to pull out the site personnel and crew from and near the Adit, just prior to the blowout, probably avoided any fatalities from the pressurized Adit blowout.

8. Although the removal investigation team was quite experienced and followed standard procedures of a well thought out work plan that included state and ARSG involvement, the underestimation of the water pressure in the Gold King Mine workings is believed to be the most significant factor relating to the blowout.

9. A limited review of internet resources did not reveal any existing guidelines or procedures for assessing highly pressurized mine adits or tunnels, such as Gold King Mine.

Recommendations:

1. EPA should develop guidance to outline the steps that should be undertaken to minimize the risk of an adit blowout associated with investigation or cleanup activities. The guidance, at a minimum, should:
   - **a.** Identify a tiered approach that requires increased detail regarding the proposed action based on the complexity of the site conditions or the potential nature of any release.
   - **b.** Provide criteria to identify whether a proposed investigation or cleanup action presents a low, moderate, or high risk with respect to the potential for an adit blowout and significant release of acid mine drainage or mine waste.
   - **c.** Require that a management review meeting(s), including the key state (and other federal agencies when appropriate) be held to determine whether sufficient information exists to meet the criteria established in the guidance or whether additional information is necessary before undertaking the investigation or cleanup activity.
   - **d.** Outline the outreach activities to inform the local community and stakeholders.
   - **e.** Identify the contingency planning that may be appropriate based upon the risk of blowout and the nature of the potential release.

2. Even though the chance of encountering pressurized mine water was investigated in many ways at the Gold King Mine, the Gold King Mine blowout suggests that EPA should develop a toolbox of additional investigative tools such as remote sensing or drilling into the mine pool from the top or side that should be more seriously considered at similar sites. It's important to recognize that underground mines may be extremely complex, making characterization of the internal hydraulic conditions and flow paths challenging. Adding to this complexity is that older mine workings are often not well mapped and that some underground mines may also be structurally unstable and prone to cave-ins and internal plugging making them very difficult to assess. The toolbox should identify techniques which could be used to minimize uncertainties associated with these types of mines. Site specific conditions may make certain investigative tools prohibitive or extremely challenging and costly. In the end, while additional information gathering may reduce the uncertainty, a complete understanding of the underground conditions may not be attainable.

3. Emergency Action Plans should include protocols should a blowout occur at those mine sites where there is a potential for such an event to occur.

4. Information and rationale developed by a site team in anticipation of an investigation or cleanup action for sites where an adit blowout could be a concern (e.g., available pressure information, a reasonable estimate of the volume of water within the mine workings, or adit drainage flow rate data) should be critically reviewed by a qualified and experienced Regional Mining engineer and or Mining Hydrologist/Geologist. The Region may want to consider getting assistance from qualified outside parties such as other federal agencies, state agencies, or outside consultants in conducting this critical review.

5. The Team also recommends that subsequent reviews of the Gold King Mine Adit Blowout by an Independent External Review Group or the Office of Inspector General consider the possibility of assembling a panel of experts consisting of mining industry experts, other federal and state mining experts, academia, consultants, non-governmental organizations and tribal governments to further analyze the situation encountered at this site and come up with recommendations on additional safeguard measures to reduce the risk and minimize the consequences of such incidents in the future.

Redacted EPA Email

1573787 - R8 SDMS

EPA

From: EPA
Sent: Sunday, August 16, 2015 9:00 PM
To: EPA
Cc:
Subject: Gold King Mine Incident Chronology

EPA I am going to go through the chronology using EPA photos...easiest for me and conveys my thinking at the time as well...

In photo 1 taken on the 4th of August we are clearing away the ruble in front of the plug area. There was a lot of unconsolidated material to be cleared away to even approach the plug area.
The visible pipes were put in previously by the state to direct flow from the adit. The adit has historically been flowing from underneath for a number of years from 70 gpm to 200 gpm. Over the years a number of pipes (one in the background right of the excavator) have been shoved into the bottom in attempts to keep the mine draining so that it would not form a mine pool. Because all this was unconsolidated material it was considered safe to remove it was not buttressing the plug. In the background you can see the unconsolidated material (loose dirt) that was overhead and how much of it filled what I call the slot the adit portal is in.

Photo 2 just shows unconsolidated dirt, pipe, culvert with pipe and water flowing from underneath and dirt overhead sluffing in....just removing dirt.

Photo 3 still dirt and water flowing from beneath pile.

Photo 4 close up of dirt.

Photo 5 Allen Sorenson (DRMS) taking a close look at where we are in the excavation of the dirt and where anything that might be considered an integral part of the plug might be showing up.
We were constantly and carefully watching for and closely inspecting the digging for indications of the plug. The sluffing dirt is evident in the picture.

Photo 6 is of the gulch below the mine dump.

Photo 7 is of hay bales we put in to catch sedimentation as we excavated.

Photo 8 shows the extent of the dirt filling the slot and gives a good understanding of why it was a puzzle just how far back the hard rock face was up this slope. To even see the plug this material had to be removed.

Photo 9 shows more pipe, water from underneath and sluffing dirt, water is ponded because flow is impeded by the sluffing dirt below down out of the picture. The excavator is working from a pad that is higher than this hole in the bottom of the slot which can be seen in the previous picture.

Photo 10 is of the gulch below the mine.

Photo 11 same.

Photo 12 here we are getting a first glimpse of the plug. The materials are a mix of the dirt sluffing material, water from the flow underneath, and timbers that were on the sides of the slot and not buttressing or holding back anything but the sites. The plug is evident by the lighter material (the caved rock) and the jumble of ruble and timbers from the sides. There were no intact timber sets at this point only what remained of the sides. An older pipe installed sometime in the past to drain the adit can be seen. At this point we were carefully inspecting the face for any sign of damp soil, change

in flow of the underneath water, change in flow of the water from the nearby old adit which was flowing steady and clear. But not getting to close because of the sluffing dirt. We cleaned out the ruble and decided to leave it like this until the next day when the entire technical team (the addition of Bruce Stover from DRMS) came to advise and determine what to do next if anything.

Photo 13 this is the next day the 5th of August the technical team is gathered on site and evaluating the situation. Here we see the outer face of the plug. It is dry and appears solid and compacted. There has definitely been a cave in. We could not inspect it closely because of dirt sluffing in from overhead. Again no change in flow of the water underneath. The sluffing dirt can be seen over the plug. Evident in this photo is the exposed timber set. The posts and cap with lagging is clearly seen. The timber set is clearly skewed down to the left from failure. What is also evident is the timber blocking on top of the cap and lagging where it was installed to try and catch up to caving and running ground in the hopes of ultimately supporting the back (roof) and stop the run of caving. With this exposed we had some indication of where the back had been and where it might be and how far to safely stay away from it. Keeping in mind that the mine should be assumed to be full of water - that is backed up to the top of the plug or higher - we did not want to get anywhere close to the top of the plug. We estimated a safe distance above the caved timber set that was not to be touched. We agreed this was as far as we were going to go in the approach to the plug. However, we needed to determine where the bedrock (hard rock surface overhead was to plan a safe approach to the plug. The lose dirt can be seen essentially draped on top of and over the plug. So we set about looking for bedrock.

Photo 14 shows the excavator doing that. We built a ramp up about 4 feet for the excavator to work from and reach higher up the face by first filling in the front of the slot with course rock for the underneath water to flow through then dump material on that to support the excavator. We brought down the dirt in carefully determined increments and dragged it forward away from the plug face for the front end loader to pick up and remove. The photo clearly illustrates the excavator doing that, the ramp that was built up for that purpose, and the large amount of dirt hanging above the face some of which was sluffing and some of which required a nudge to bring down. Again there was no change in flow of the water underneath.

Photo 15 illustrates the continuation of this process with pile of material awaiting the loader to pick it up and remove it. The face of the plug is well below these excavations.

Photo 16 shows the face a bit cleaner with the excavator out and a pile of material waiting to be picked up by the front end loader. The ramp for the excavator is clearly shown. At this point we had clearly found the bedrock and there was very little material left hanging above.

Photo 17 is the same shot as the previous only zoomed in because we had spotted a small stream of clear water that at first looked like a spring coming from the rock face below the white spot on the face. I think it is visible in this photo but not positive. At this point I had the loader back out as I think he was about to pick up the load in the foreground and I went in as far as I safely could to see if in fact it was a spring. On as close inspection as I dared I could see that the clear water was spurting up not down. A couple of minutes later red water began to flow out from near that spot. We cleared the area. At first it did not appear as if it would be very much flow but it steadily increased and in a couple of minutes it became obvious there was a lot of water coming. We ensured that we had cleared the area of ourselves and equipment and began to find a way to make the necessary notifications. There is no cell phone service at the site and satellite service is unreliable so no satellite phone was at the local but we did have two way radios that had proven to be reliable so we contacted workers down the mountain working on another site and told them to keep anyone away from the gulch and creek where the flow was headed. Then sent one of them to get the Colorado State DRMS people who had left the site a short time before (that was when we all decided we could see enough of the plug and decided to just look for the bedrock above) to look at anther mine. They got to the State guys who knew the notification system and did all the necessary notifications. I defer to their description and chronology at this point.

Someone did come up to get the RM and myself so that we could go down and ensure all notifications had been made and see what needed to be done.

The rest is our rebuilding the roads to get out, diverting the water from the adit back into the flume (half culvert), and planning the recovery as per the National Contingency Plan (NCP).

This is a long discussion so please extract out the content you need for brevity but it helped me to step through the sequence of events.

Hays

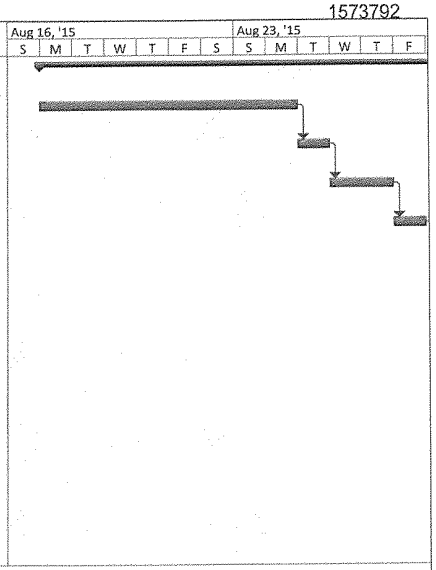
This discussion is subject to attorney/client privileges.

Sent from my iPad

Work Schedule

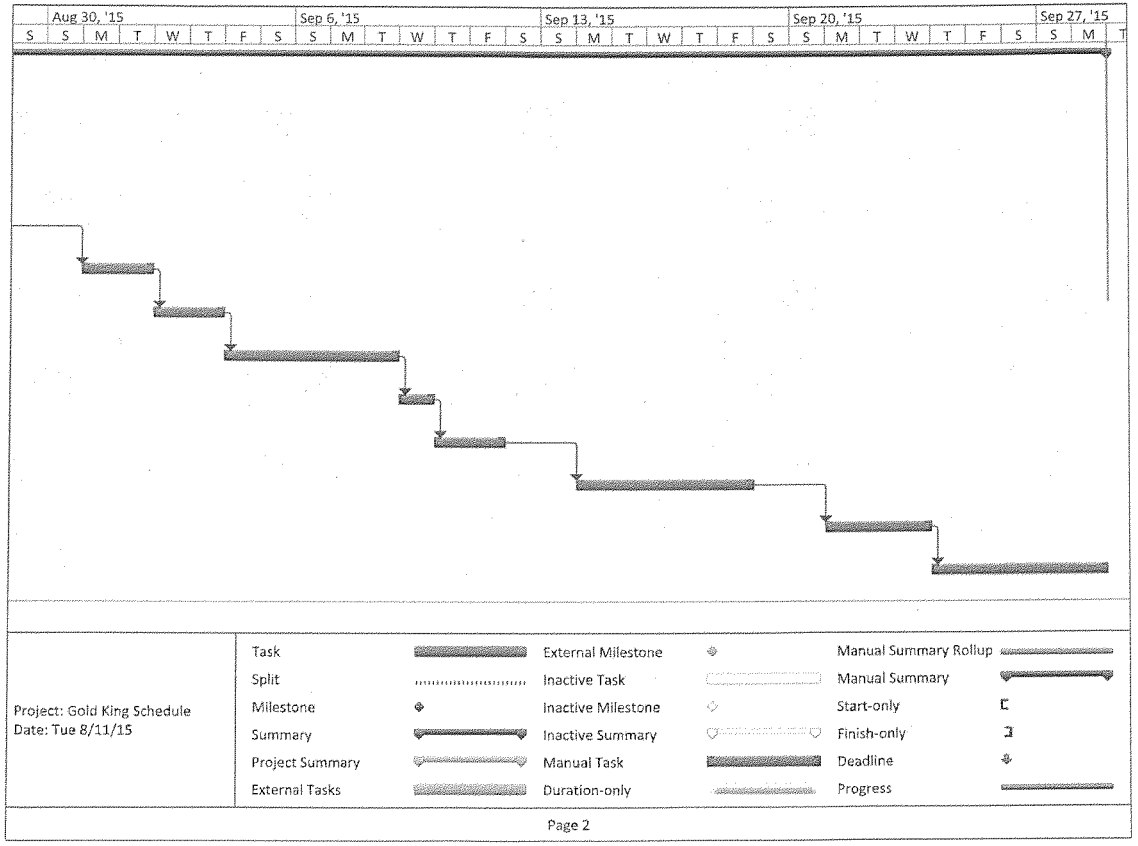
1573792

ID		Task Mode	Task Name	Duration	Start	Finish
1			**Gold King Portal Development**	**31 days**	**Mon 8/17/15**	**Mon 9/28/15**
2			Mobilize and Set-up	6 days	Mon 8/17/15	Mon 8/24/15
3			Establish Access to High Wall	1 day	Tue 8/25/15	Tue 8/25/15
4			Support High Wall - Mesh and Bolt	2 days	Wed 8/26/15	Thu 8/27/15
5			Excavate Highwall to Sill Level	1 day	Fri 8/28/15	Fri 8/28/15
6			Set-up Pumping System	2 days	Mon 8/31/15	Tue 9/1/15
7			Install Drain Line	2 days	Wed 9/2/15	Thu 9/3/15
8			Install Portal Pipe Culvert	3 days	Fri 9/4/15	Tue 9/8/15
9			Bolt Tunnel Brow	1 day	Wed 9/9/15	Wed 9/9/15
10			Reestablish Access to Portal	2 days	Thu 9/10/15	Fri 9/11/15
11			Clean and Support 100' of Tunnel	5 days	Mon 9/14/15	Fri 9/18/15
12			Fabricate and Install Portal Gate	3 days	Mon 9/21/15	Wed 9/23/15
13			Demobilize	3 days	Thu 9/24/15	Mon 9/28/15



Project: Gold King Schedule
Date: Tue 8/11/15

Task		External Milestone		Manual Summary Rollup	
Split		Inactive Task		Manual Summary	
Milestone		Inactive Milestone		Start-only	
Summary		Inactive Summary		Finish-only	
Project Summary		Manual Task		Deadline	
External Tasks		Duration-only		Progress	


Aug 30, '15
Sep 6, '15
Sep 13, '15
Sep 20, '15
Sep 27, '15
S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T
Project: Gold King Schedule
Date: Tue 8/11/15
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress
Page 2

1573798 - R8 SDMS

Red and Bonita / Gold King Operational Plan – Draft 5/22/2015

Pre-Field Season

1. Water Monitoring Planning
    a. START will plan to sample 4 mines plus Cement Creek at CC-18 (downstream of American Tunnel) before any work begins and after bulkhead installation (as late in the season as practical) and prepare a SAP
    b. START will prepare a request for analysis for submittal to [redacted] at EPA and provide estimated sampling/sample delivery dates (early to mid-July and late September?)
2. Water Treatment
    a. R&B Pond Expansion
        i. START will prepare a design sketch to guide pond expansion
        ii. START will estimate material requirements for pond liner replacement
        iii. START will estimate soil generation quantities and berm installation soil requirements
        iv. ERRS will order geotextile liner
        v. ERRS will plan pond expansion construction, including removal and disposal of 2014 solids into temporary repository
            1. 15' excavation at north end of ponds
            2. Level base to extent practical (can't go below water table or through bedrock)
            3. Increase height of south and west berms to 6' above base
            4. Increase height of internal berms to 5.5' above base with 5' wide overflow weirs that are only 5' above base at one end of each cell (see plans)
        vi. ERRS will plan for water diversion into the pond, including the ability to direct water to either of the upper 2 cells
            1. Provide a means of reducing the velocity of pond inflow such as diffusers or baffles
            2. Provide headgates as needed to allow flow to traditional flow path when ponds are not in use
    b. Water Treatment
        i. START will estimate caustic (25% NaOH) and flocculant requirements
            1. R&B
            2. GK
        ii. START will propose injection equipment
        iii. ERRS and/or START will procure injection equipment? (flocculant feeder/caustic pumps)
        iv. ERRS will procure caustic and flocculant
        v. ERRS will plan to safely secure caustic containers and provide secondary containment for containers, patch kits for any leaks, and overpack
        vi. ERRS will provide the pond discharge equipment (pumps, outlet flotation buoys, support structures)
        vii. ERRS will provide a filter bag/manifold system with at least 3 filter bags

viii. ERRS will plan for equipment to transport high-liquid-content solids from Cells 2, 3, and 4 to Cell 1 as needed to maintain pond capacity for subsequent solids settling

3. R&B Bulkhead
    a. ERRS will assign tasking for R&B in-mine solids cleanout work (ERRS or subcontractor)
    b. ERRS will procure a bulkhead contractor to perform R&B in-mine work
        i. SOW from DRMS
        ii. Site walks?
        iii. Estimated start in early August
    c. ERRS will plan any R&B portal or road improvements needed to allow bulkhead construction
    d. In-mine HASP prepared by ERRS, DRMS, and/or subcontractor
4. Gold King Adit Opening
    a. ERRS will plan road upgrade/reconstruction and estimate required materials, equipment and personnel
    b. ERRS will determine which work will be performed by ERRs personnel and which by subcontractor
    c. ERRS will procure subcontractor to do in-mine work
    d. ERRS will plan to have equipment and personnel to support portal reconstruction efforts
    e. ERRS will plan and estimate materials quantities for water conveyance system to R&B ponds for treatment
        i. ERRS will prepare an aerial photo map showing route
        ii. Land ownership issues?
        iii. ERRS will procure piping supplies and plan pipe installation, including layout, assembly, pipe protection/slope security, and system test
    f. In-mine HASP prepared by ERRS, DRMS, and/or subcontractor

Mobilization

1. ERRS will mobilize personnel, equipment, and materials to the site
    a. excavation/transport equipment
    b. road upgrade/reconstruction equipment
    c. pond construction materials (geotextile liner, hay bales, fasteners, etc.)
    d. materials to support bulkhead construction (see bulkhead SOW from DRMS)
    e. water treatment materials (flocculant, caustic, flocculant feeder)
    f. Support facilities for bulkhead construction
    g. Portal attendant for bulkhead construction
    h. Portal improvements?
    i. Equipment to mobilize solids within R&B tunnel
2. START will mobilize personnel and equipment to the site
    a. 2-3 people for 2-3 days, 2 people afterward
    b. START-supplied water treatment equipment , peristaltic pumps)
    c. pH meter
    d. Sampling supplies for 30 water samples including quality control, field filtering equipment, Scribe/COC ability, GPS, shipping supplies
    e. Flow measurement equipment (temporary flumes, level, flow meter)

f. START needs to sample water prior to any actions that would disturb water quality at R&B or Gold King

Daily Operations

1. ERRS will perform daily H&S meetings and ensure efforts of ERRS, START, and subcontractors are coordinated
2. 8 am start of work unless otherwise notified

Pond Upgrades

1. ERRS will remove 2014 solids from existing ponds (may be in conjunction with liner removal/pond upgrade installation)
2. ERRS will pull back liner material from north end of pond and from south and east berms
3. ERRS will excavate the pond base to 15' north of the current pond base and 2H:1V slopes at the north end and sides of the pond
4. ERRS will build up the outer berms to be 6' above the elevation of the pond base
5. ERRS will install a 5.5' high inter-cell berm at the former north end of the pond system (the newly excavated area will be a new cell)
6. ERRS will build up the inter-cell berms to a level of 5.5' above the pond base with a 5' wide spillway at 5' above the pond base to allow flow to subsequent cell (see plan for location of spillway)
    a. The existing inter-cell berms may be either 1) reconstructed or 2) left in place, built up with secured hay bales or coir logs or other stable material, and covered with geotextile to achieve the 5.5' inter-pond berm height
7. START will measure elevations of the pond base and berm heights to ensure they are level and the correct dimensions to the extent practical
8. The pond base will not be extended below the water table or through bedrock
9. ERRS will install piping to carry water from where it flows to the base of the waste rock pile under the road to both cells 1 and 2 of the pond system, including headgates, piping, and diffusers/baffles to reduce the velocity of flow into each pond
    a. 18" pipe is suggested due to potentially high solids content of water
10. ERRS will place water treatment chemicals (NaOH at top of hill, flocculant in level spot at base of hill)
    a. NaOH totes/drums will be safely secured and surrounded by secondary containment
11. ERRS will provide power for water treatment pumps (NaOH at top of hill, flocculant at bottom of hill, discharge pump in Cell 4)
12. ERRS will provide a tote of clean water??

Solids Removal from R&B Adit

1. Water treatment setup prior to entry
2. Each day, ERRS or the contractor who enters mine will measure air quality (or START to provide air monitoring equipment/personnel?) and ventilation will be provided if needed
3. ERRS will have a fan and generator available if needed to ventilate mine (ventilation bags should still be in place)

    a. Generator should be placed away from mine entrance to reduce potential for drawing fumes into the mine
4. ERRS or contractor loosens solids material and directs towards portal
5. ERRS person as portal attendant and to watch flow of solids through portal pond
    a. Stop work when solids back up in portal pond or base of hill
    b. Possible need for ERRS person to keep water and solids flowing through the portal pond
6. START monitors pH and adjusts caustic injection rate
7. START monitors Brenflocc addition system and watches flow of solids to pond
8. START and ERRS monitor flow of water through treatment ponds
    a. Ensure water in 4th cell is clear prior to discharge toward Cement Creek
    b. If water is not clear but ponds are full, direct discharge toward filter bag system
    c. Monitor discharge toward Cement Creek
        i. Stop solids generation activities in mine if discharges contain significant quantities of solids

Bulkhead Construction

1. ERRS will contract for installation of a cofferdam.
2. Subcontractor will perform work in accordance with SOW prepared by DRMS
    a. Subcontractor will install a concrete piping system to the bulkhead location.
    b. Subcontractor will prepare the bulkhead location for installation of the bulkhead.
    c. Subcontractor will build framework for the bulkhead and formwork for concrete pour.
    d. Subcontractor will pour concrete as a continuous, single pour.
    e. START or ERRS will arrange for concrete testing and provide test results when available
        i. Concrete tester will be on-site for workability tests (air entrapment/ slump test)
        ii. Concrete tester will collect concrete for strength testing cylinders.
        iii. START will work with the concrete tester to conduct testing in accordance with the plans and specifications.
3. ERRS will provide portal attendants
4. ERRS will ensure safe access to mine sites

Gold King Water Conveyance System

1. ERRS will assemble and protect the water conveyance system
    a. Pipe layout
    b. Assembly
    c. Pipe protection/slope security
2. System Test (START and ERRS)
3. ERRS will construct the backup water conveyance system
    a. Add bypass around flume for if needed
    b.

Gold King Adit Excavation

1. ERRS subcontractor will coordinate work
2. ERRS personnel available with excavator, soil transport personnel and equipment?

Gold King Rehab (TBD)

Gold King Site Stabilization

1.

Demobilization

Gold King Mine - Watershed Fact Sheet

GOLD KING MINE – WATERSHED FACT SHEET

Site Names: Upper Animas Watershed, Upper Cement Creek
City: Silverton
County: San Juan
Location: latitude: 37.8945° N; longitude: 107.6384° W; approximately 11,000 feet elevation

HISTORICAL BACKGROUND:

The Gold King Mine (GKM) was discovered by Olaf Nelson in 1887, with operations continuing until 1907 when a fire destroyed the surface buildings of the mine. The mine was reopened in 1910 but closed shortly thereafter because of litigation and labor problems. In 1918 a new company bought the mine and operated it until the fall of 1922. The GKM shipped 711,144 tons of gold and silver ore while in operation. The mine has been inactive since then. It is currently owned by San Juan Corporation.

The GKM is located in the Upper Animas Watershed in southwestern Colorado. These watersheds within the volcanic terrain of the San Juan Mountains contain some 400 abandoned and inactive mine sites, which have been the focus of both large- and small-scale mining operations between 1871 and 1991.The watershed consists of three main streams, the Animas, Cement Creek and Mineral Creek all of which drain the Silverton Caldera. The Animas River and many of its tributaries are historically impacted by high concentrations of heavy metals from both acid rock/mine drainage at mine sites and from naturally occurring metal loading sources not impacted by mining.

Mining operations contributed to metals loading to alpine streams and creeks adding to the natural metal loading already occurring in the mineralized area. As a common practice, mine tailings were directly deposited into the creeks and rivers until the 1930's. Water draining from the mines occurs when mining operations in the mountainsides alter the hydrology of the area and combine with natural springs, pulling water into mine tunnels. The water reacts with iron disulfide (pyrite) and oxygen to form sulfuric acid (acid rock/mine drainage). The resulting acidic water dissolves naturally occurring heavy metals such as zinc, lead, cadmium, copper and aluminum and results in water containing these metals flowing out of the mine adits (a horizontal shaft into a mine, which is used for access or drainage).

By the end of mining operations, many of the mines were left discharging contaminated water into streams. In 1991, the last big mine in the region, the Sunnyside, stopped mining. Its owner, Sunnyside Gold Corp., agreed not only to bulkhead (mine plug) its mine, but also to clean up abandoned mines nearby, while continuing to run the metal-laden waters of upper Cement Creek through a water treatment facility.

Sunnyside also reached an agreement with the state and Gold King mining to turn over its water treatment operations to Gold King. At that time, the GKM, like the nearby Red and Bonita mine, had not discharged any water. However, after Sunnyside closed, water found natural fractures that allowed it to flow into the GKM and Red and Bonita mines. Initially, these waters were run through the treatment plant that Sunnyside built, but Gold King ran into technical, financial and legal troubles and the treatment plant stopped operating.

The GKM is one of an estimated 23,000 abandoned mines dotting the state of Colorado. Of these abandoned mines, 6,127 have been made safe by the Colorado Division of Reclamation, Mining and Safety.

PREVIOUS WATER RELEASE INCIDENTS IN THE AREA:

1975 – A tailings pile on the banks of the Animas River northeast of Silverton was breached, dumping tens of thousands of gallons of water, along with 50,000 tons of heavy-metal-loaded tailings into the Animas.

1978 – Sunnyside Mine worker breached the floor of Lake Emma sending an estimated 500 million gallons of water through the mines, sweeping up huge machinery, tailings and sludge, and ultimately releasing through the American Tunnel to downstream waters.

SITE ASSESSMENT:

EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted a Superfund Site Assessment of the area in the 1990s. The assessment showed that water quality standards were not achieved in the Animas River near Silverton and identified the severe impacts to aquatic life in the Upper Animas and its tributaries from naturally occurring and mining-related heavy metals. In recognition of the community-based collaborative effort, EPA agreed to postpone adding all or a portion of the site to the Superfund NPL, as long as progress was being made to improve the water quality of the Animas River.

Until approximately 2005, water quality in the Animas River was improving. However, since 2005, water quality in the Animas River has not improved and, for at least 20 miles below the confluence with Cement Creek and the water quality has declined significantly. Impacts to aquatic life were also demonstrated by fish population surveys conducted by Colorado Parks and Wildlife, which found no fish in the Animas River below Cement Creek for approximately two miles and observed precipitous declines in fish populations as far as 20 miles downstream since 2005.

Because of this declining water quality in the Animas River, in 2008, EPA's Superfund Site Assessment program began investigations in Upper Cement Creek focused on evaluating whether the Upper Cement Creek area alone would qualify for inclusion on the NPL. This evaluation indicated that the area would qualify, although after receiving additional community input, EPA postponed efforts to include the area on the National Priorities List. Since that time, EPA has continued and broadened its investigations of conditions at the site in order to understand the major sources of heavy metal contamination in the Upper Animas.

SITE RISK:

Mining operations have greatly disturbed the land, adding to existing highly mineralized conditions in many areas of the site. Mineralized waste rock exposed to air and water causes acidic conditions to mobilize the release of heavy metals to the surrounding environment. These heavy metals have found their way into the Animas River and its tributaries and have eventually traveled farther downstream.

Media Affected	Contaminants	Source of Contamination
surface water, subsurface water, surface soils and stream sediments	heavy metals – aluminum, lead, zinc, cadmium, copper, iron and manganese	historic mining activities and naturally occurring mineralization

CLEANUP PROGRESS:

Numerous mine reclamation and mine waste cleanup projects have been completed in the Upper Animas watershed over the last 20 years. These efforts have included diverting runoff away from and capping mine waste piles, moving mine waste piles away from drainages, consolidating mine waste piles and re-vegetating mine waste piles.

OTHER CLEAN UP EFFORTS:

The Animas River Stakeholders Group (ARSG), a collaboration between concerned citizens and representatives from industry and federal and state agencies, was created in 1994 to address the water discharges. The ARSG, along with federal and state agencies, continue to work to clean up the mines.

In addition, ARSG has been using a watershed approach and has developed a remediation plan, recommended feasible water quality standards (which were adopted in 2001) and has implemented remediation projects throughout the Upper Animas River Basin.

1574032

START 4 - REGION 8

DRAFT TECHNICAL MEMORANDUM

TO: [redacted] EPA Region 8, On-Scene Coordinator

FROM: [redacted], Superfund Technical Assessment and Response Team (START)

DATE: August 12, 2015

SUBJECT: Gold King Mine Investigation and Blowout Event

The United States Environmental Protection Agency (EPA) tasked the Weston Solutions, Inc., (WESTON) Superfund Technical Assessment and Response Team (START) under Technical Direction Document (TDD) #1408-01 to support U.S. EPA's efforts at the Gold King Mine site near Silverton, San Juan County, Colorado. The EPA was investigating the mine due to its proximity and potential for increased flows in relation to the bulkheading of the Red and Bonita Mine located on the same mountain (Bonita Mountain).

2015 Field Activities Prior to Blowout

START [redacted] the EPA On-Scene Coordinator [redacted] and EPA's Emergency and Rapid Response Services (ERRS) contractor Environmental Restoration, LLC [redacted] visited the Gold King Mine on June 24, 2015 to document current flows and seek a viable path to pipe water from the Gold King to the Red and Bonita water treatment system. Gold King Mine discharge flow measured 31 gallons per minute (gpm). START planned to collect Gold King discharge water quality data and a sample on June 25, 2015, but due to deteriorating snow pack, no safe path existed to reach the site and no sample was collected from the Gold King mine discharge.

START [redacted] remobilized to the Red and Bonita and Gold King sites on July 13, 2015. On July 15, Gold King Mine discharge flow and water quality parameters were measured and a water sample was collected from the discharge. Gold King Mine discharge flow measured 69 gpm. Samples were not delivered to the laboratory by FedEx until July 20 and the temperature of the samples exceeded the hold requirements. The sample results are pending.

On July 23, 2015 START visited the Gold King Mine to measure discharge flow in the existing flume and discuss installing a sump basin to treat water that would be pumped from the mine for work scheduled to begin in August. It was decided a 5 foot or 6 foot HDPE pipe would be set on end in the ground and a 12 inch HDPE pipe would be used to allow flow to follow the natural flow path over the eastern end of the mine dump when water treatment was unnecessary. On July 24, the ERRS contractor began grading the mine dump and excavating a trench to install the sump basin. START brought a transit on site to verify elevations. Gold King Mine discharge flow measured 69 gpm.

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By July 28, 2015 the sump basin and outflow pipe were installed and connected and work on the filter bag alternative for Gold King was being discussed and outlined.

On July 29, 2015 the pipeline and pump supplier visited the site to discuss options for pumping water from the Gold King to the Red and Bonita treatment ponds. Various options were considered and the vendor planned to supply the ERRS contractor with options. That afternoon the ERRS contractor removed some loose material from above the assumed portal location in an attempt to find native bedrock.

On July 30, 2015 the ERRS contractor had removed material above the collapsed pipes to the back of them, leaving the top of the top pipe covered and ceased investigation. Grading for the filter bag setup began.

On July 31, 2015 the ERRS contractor began laying out the manifold system for the filter bag system to provide backup water filtration at the Gold King Mine during the anticipated 2015 mine work.

On August 3, 2015 the ERRS contractor continued work on the filter bag manifold and grading to allow the filter bags to drain into the half channel at Gold King.

On August 4, 2015 EPA OSC [redacted] arrived on site at 08:45 and [redacted] from Colorado Division of Mining Reclamation and Safety (DRMS) arrived at the Gold King Mine at 09:45. [redacted] discussed how to proceed with the site. Per their instruction, the ERRS contractor began excavating the collapse area while minimizing water discharge at 10:30. At 14:00 the excavation was proceeding slowly, and at 16:00 a set of collapsed timbers with what appeared to be an opening was uncovered. The situation was left to be considered overnight.

Field Activities on the Day of the Gold King Mine Blowout – August 5, 2015

Below is a summary of the START field notes and recollection of site activities at the Gold King the day of the mine blowout.

09:00 EPA OSC [redacted] and ERRS contractors were up at the Gold King Mine. Due to excavation activities, the GSA Suburban was parked at the toe of the mine dump.

09:30 DRMS personnel [redacted] and the EPA OSC [redacted] discussed the mine adit situation and determined that excavation should be continued. DRMS said due to the severity of the collapse a series of plates might need to be used to build the 10 foot culvert further back into the mine beyond the collapse to allow dewatering and water treatment.

10:30 (approximate) DRMS left the site to investigate the bulkhead in the nearby Mogul Mine.

10:51 A small leak was observed approximately 15 to 20 feet above the anticipated elevation of the floor of the adit. Work stopped and the excavator moved back from the excavation area.

10:54 The hole had begun to enlarge and water was pouring out.

10:58 The hole had expanded significantly, later measured at about 10 feet wide by 15 feet high. Portions of the mine tailings dump and access road had begun to wash away. At this time START realized that the GSA Suburban had been parked at the toe of the mine tailings dump where much of the

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discharged water had flowed. The vehicle was later found it to be water damaged, would not start, and was un-drivable.

11:33 pH testing (using pH indicator paper) of mine discharge water showed a pH of approximately 4.5.

11:40 Mine discharge flow had slowed enough to be safely diverted into the existing culvert system.

11:45 DRMS personnel reported by radio that they were out of the Mogul and left the site to notify local resources and the EPA.

11:50 [redacted] and the ERRS contractor manager [redacted] left the Gold King on foot to get picked up and driven to an area with phone reception to notify authorities. The START contractor [redacted] stayed at the mine adit area to monitor the mine for additional surges of water and to provide support to the ERRS operator rebuilding the road.

12:20 The ERRS contractor began reconstructing the exit road from the site to help demobilize the equipment, vehicles, and personnel.

12:30 According to radio communications, ERRS personnel working at the nearby Red and Bonita site submitted a call for Flight for Life assistance because a tourist had injured themselves on Corkscrew Pass. This call was not related to the Gold King Mine incident.

13:30 An unknown visitor drove up the Gold King Mine Road and viewed the site for 15 minutes then left.

14:00 The discharge water flow steadily declined until this point and then appeared to stabilize.

14:15 The flight for life helicopter flew by the site.

15:00 The pH of the discharge still measured approximately 4.5 on pH indicator paper.

15:05 DRMS personnel returned to the site.

15:20 The ERRS contractor had reconstructed a temporary road for all equipment and personnel to be moved off site.

15:30 – EPA, DRMS, ERRS, and START viewed the portal area. DRMS measured the width of the portal to be approximately 10 feet.

17:00 – The water treatment system at Red and Bonita was decontaminated and stored for the evening.

18:00 – The ERRS contractor gave the START contractor a ride to his lodging.

2015 Field Activities Post Blowout (Through 8/8)

START has been monitoring flow rates, checking pH of the mine discharge, and assisting with water treatment. The Gold King Mine discharge pH has been approximately 3 (as measured by a Horiba water quality meter) and the flow rate decreased from 748 gpm to 587 gpm as of August 8.

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Water treatment consisted of adding sodium hydroxide (25% solution) at a rate of 2 liters/minute and adding approximately 10 ounces of powdered Brennfloc every 10 minutes to the half pipe channel outside the Gold King Mine. A treatment option including lime for pH adjustment was being considered.

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WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
1	08/04/2015

Direction Photo Taken:

North

Description:
Beginning investigation into collapsed adit.

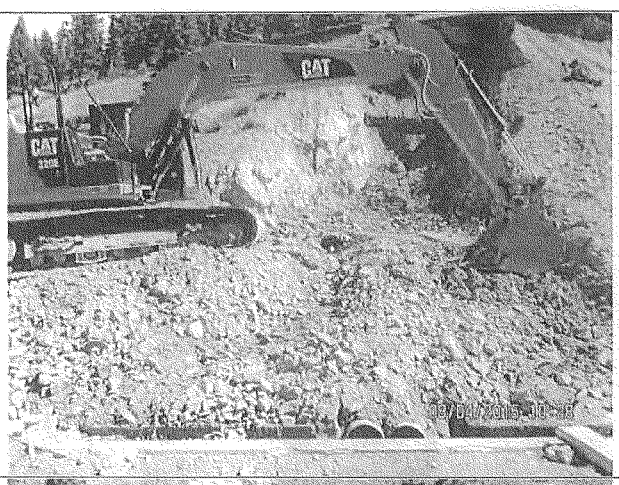
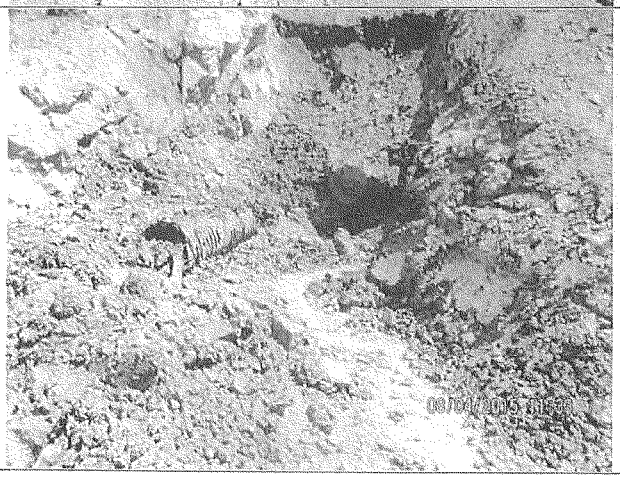


Photo No.	Date:
2	08/04/2015

Direction Photo Taken:

North

Description:
Excavated next to DRMS-installed culvert, water muddy from soil disturbance.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
3	08/04/2015

Direction Photo Taken:

Down

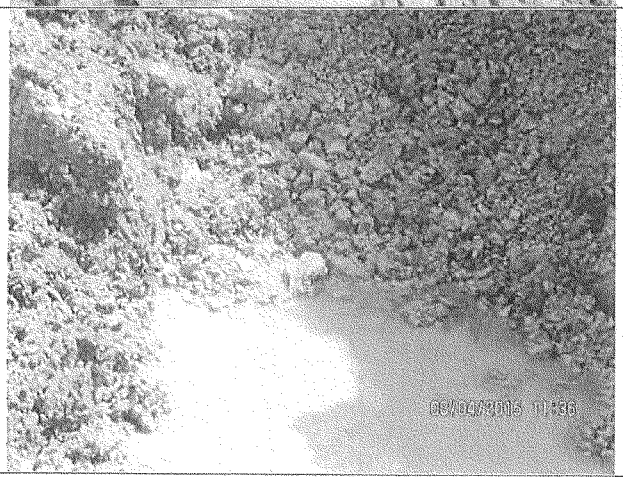
Description:
Seepage from soil next to piping.

Photo No.	Date:
4	08/04/2015

Direction Photo Taken:

Down

Description:
Seepage next to the pipe is clear until entering disturbed soil.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
5	[illegible]

Direction Photo Taken:

North

Description:

DRMB looking at adit excavation progress.

Photo No.	Date:
6	[illegible]

Direction Photo Taken:

West

Description:

Water minimally murky from disturbed soil and water entering the North Fork from site.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
7	08/04/2015

Direction Photo Taken:

South/Down

Description:
Hay bales installed as filter for sediment in North Fork.

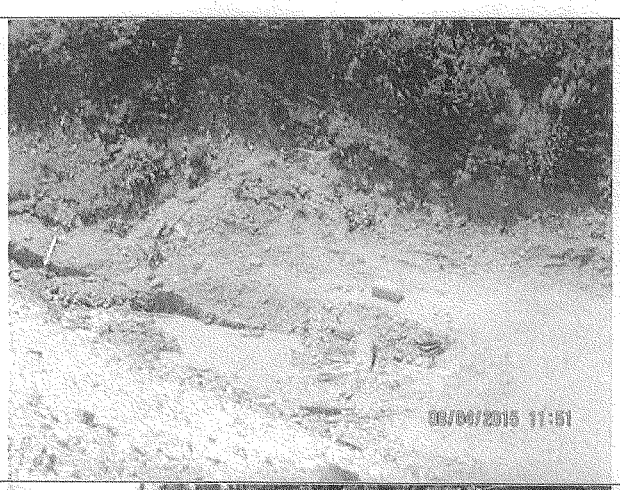
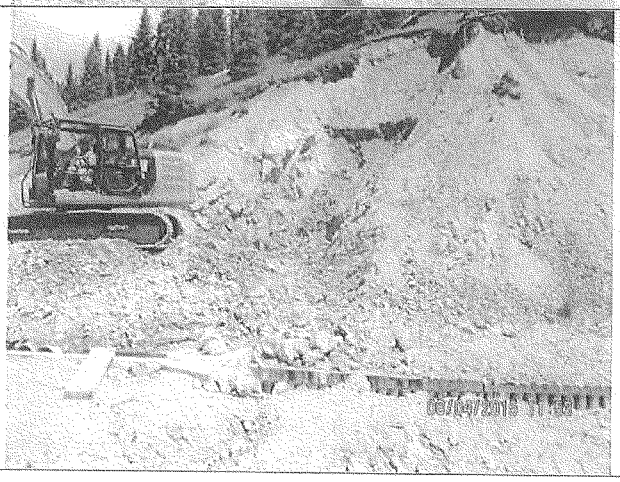


Photo No.	Date:
8	08/04/2015

Direction Photo Taken:

Northwest

Description:
Continuing excavation at the collapsed adit, no solid bedrock found for tunnel support.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
9	06/04/2015

Direction Photo Taken:

Northeast

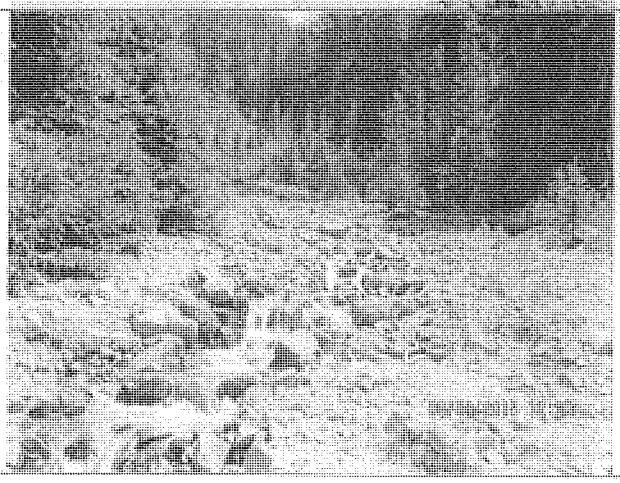
Description:
Flat apron of adit, support pillar with tagging.

Photo No.	Date:
10	06/04/2015

Direction Photo Taken:

East

Description:
Water of the North Fork just upstream of Cement Creek.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
11	08/04/2015

Direction Photo Taken:

East

Description:
Water of the North Fork just upstream of Cement Creek.

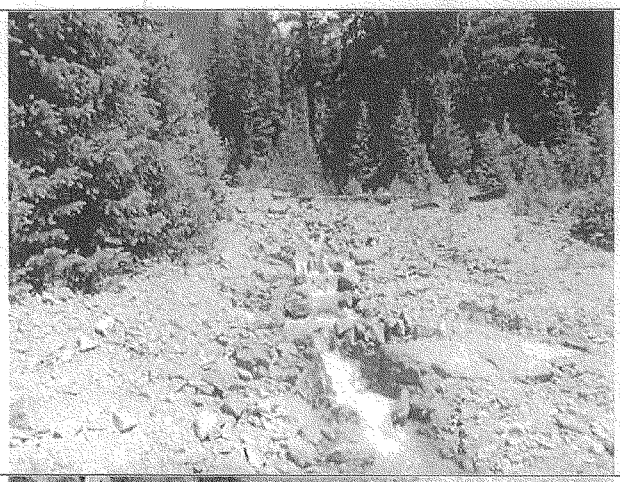


Photo No.	Date:
12	08/04/2015

Direction Photo Taken:

North

Description:

Collapsed supports uncovered above anticipated adit, no sign of bedrock above the adit area.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
13	08/05/2015

Direction Photo Taken:

North

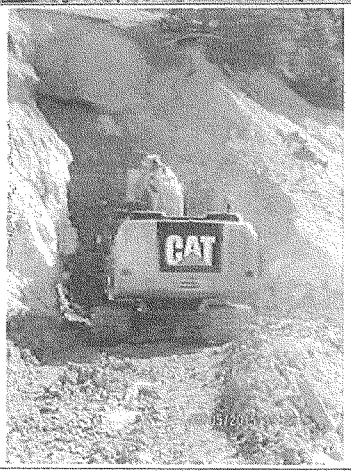
Description:
Adit conditions the morning of 8/5.

Photo No.	Date:
14	08/05/2015

Direction Photo Taken:

Northeast

Description:
Excavating material above the collapsed adit.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
15	08/05/2015

Direction Photo Taken:

North

Description:
Bedrock found above the anticipated adit.

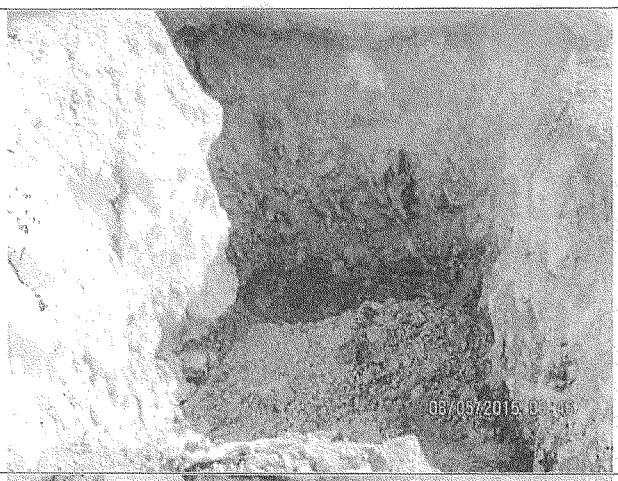
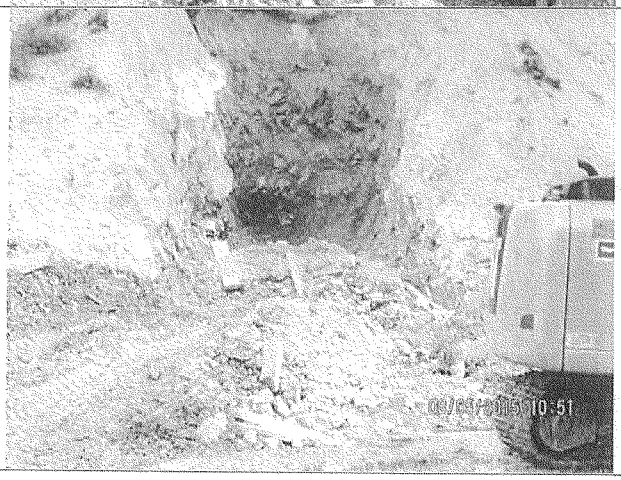


Photo No.	Date:
16	08/05/2015

Direction Photo Taken:

North

Description:
Cleaning out excavated material, small leak.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
17	08/05/2015

Direction Photo Taken:

North

Description:
Small leak close up.

Photo No.	Date:
18	08/05/2015

Direction Photo Taken:

North

Description:
Hole starting to give way to flow.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
19	[illegible]

Direction Photo Taken:

Northeast

Description:

Adit flow increasing.

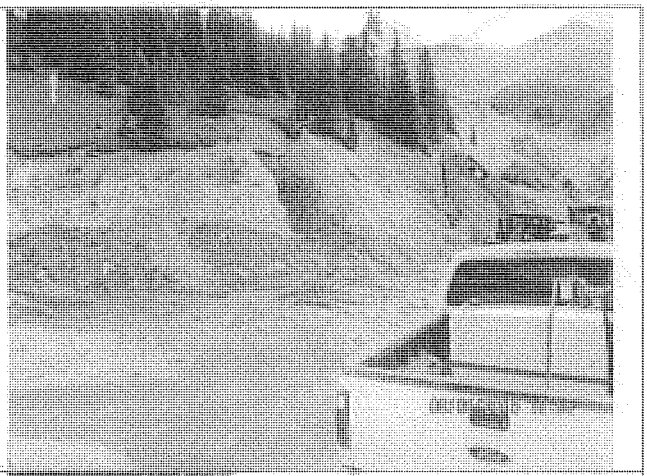
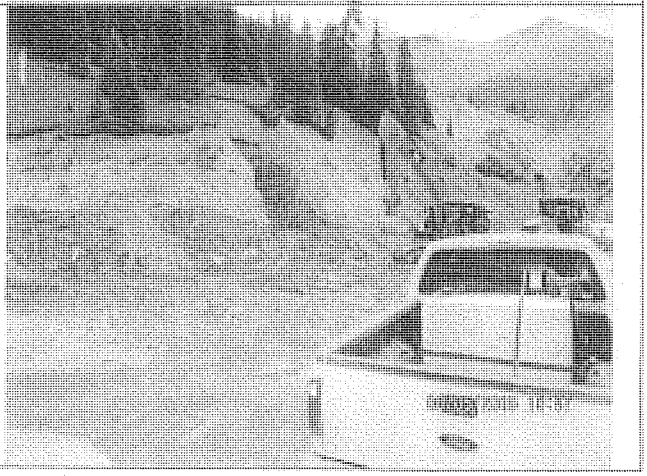


Photo No.	Date:
20	08/18/2015

Direction Photo Taken:

Northeast

Description:
Water flowing out at increased rate.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
21	08/05/2015

Direction Photo Taken:

West

Description:
Water flowing along access road and across waste dump.

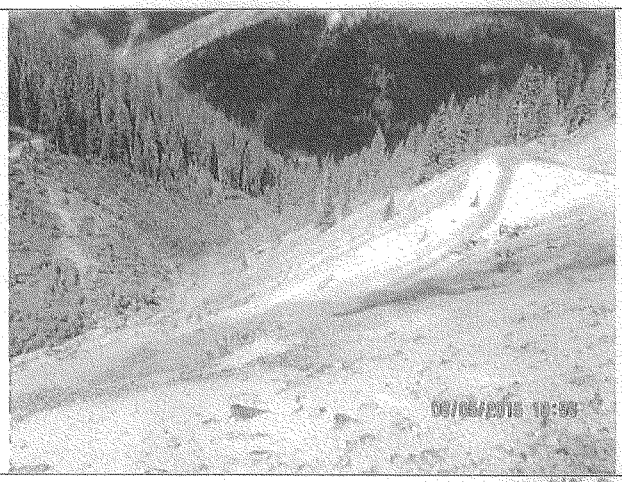


Photo No.	Date:
22	08/05/2015

Direction Photo Taken:

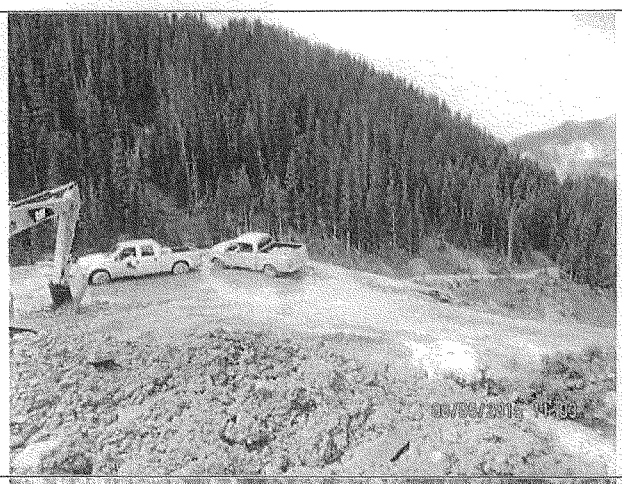
Southeast

Description:
Water flowing over the edge of the waste dump and collapsing the edge.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:	
23	08/05/2015	

Direction Photo Taken:

Southwest

Description:
Exit route starting to collapse

Photo No.	Date:	
24	08/05/2015	

Direction Photo Taken:

Southeast/Down

Description:
Edge of the tailings dump collapsed, suburban trapped and half submerged in center of photo.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
25	08/05/2015

Direction Photo Taken:

Northeast

Description:
Gold King adit exposed.

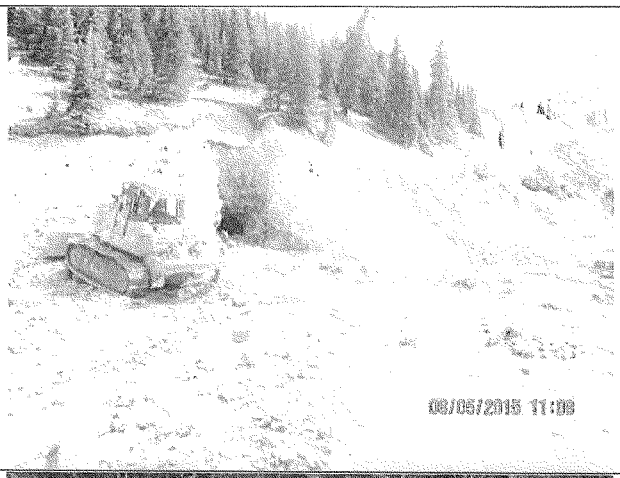


Photo No.	Date:
26	08/05/2015

Direction Photo Taken:

Southeast

Description:

Water flow washing out the existing road. Note Suburban in left side of photo.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
27	08/05/2015

Direction Photo Taken:

North

Description:
Exposed adit, roughly 10 feet wide by 15 feet high.

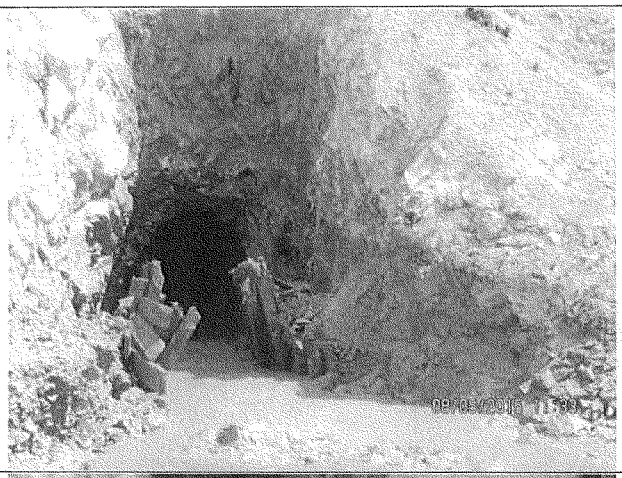


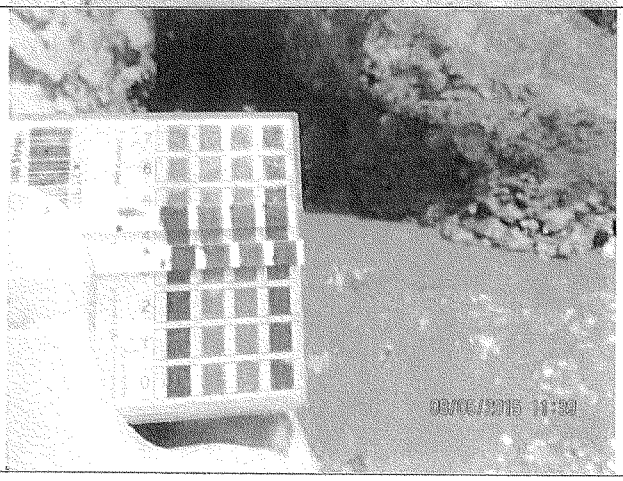
Photo No.	Date:
28	08/05/2015

Direction Photo Taken:

North

Description:

pH of discharge water is approximately 4 to 4.5.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
29	08/05/2015

Direction Photo Taken:

Northeast

Description:
Excavator redirecting water into existing half-pipe channel.

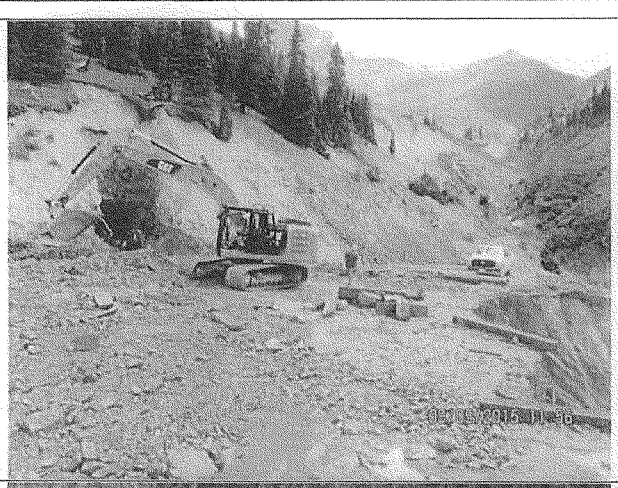
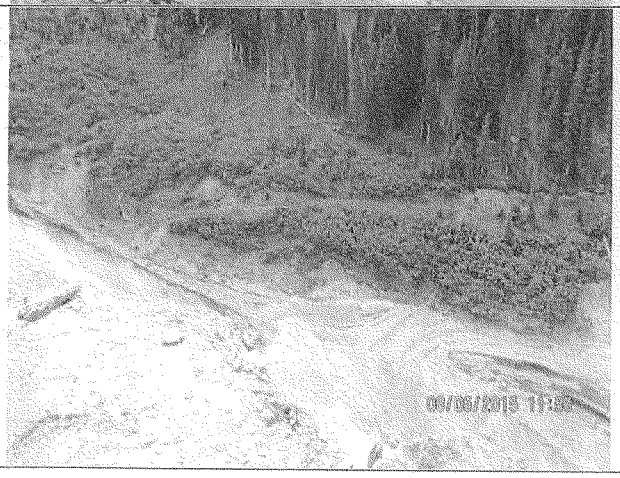


Photo No.	Date:
30	08/05/2015

Direction Photo Taken:

Southeast/Down

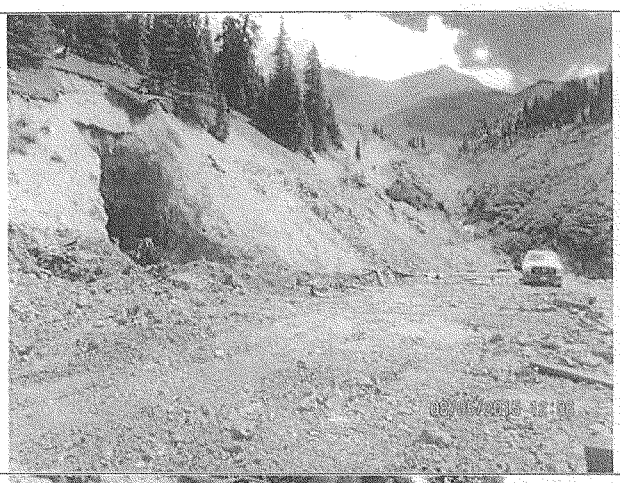
Description:
Collapsed portion of waste dump and road wash out.



WESTON SOLUTIONS

PHOTOGRAPH LOG

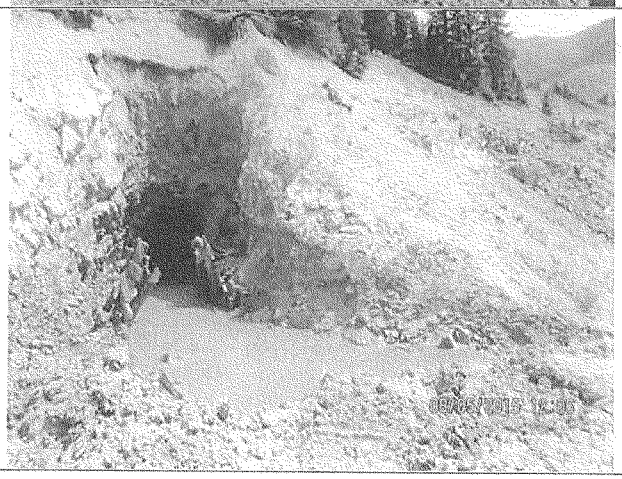
Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:	
31	08/05/2015	

Direction Photo Taken:

Northeast

Description:
Adit area after regrading.

Photo No.	Date:	
32	08/05/2015	

Direction Photo Taken:

North

Description:
Exposed adit and redirected flow, flow is beginning to subside.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1406-01

Photo No.	Date:
33	08/05/2015

Direction Photo Taken:

East

Description:
Redirected flow into existing half culvert channel.

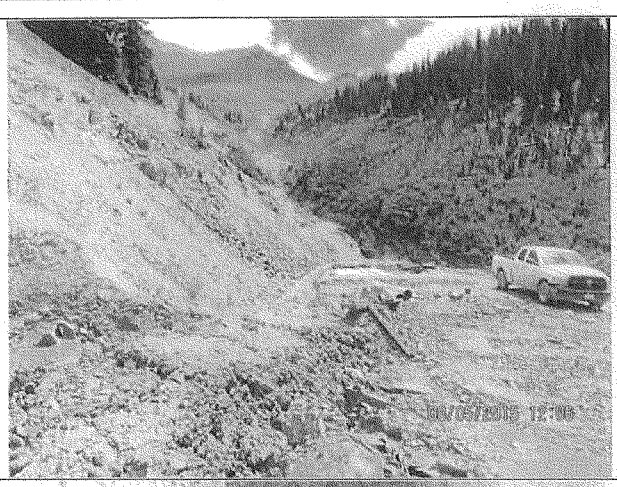
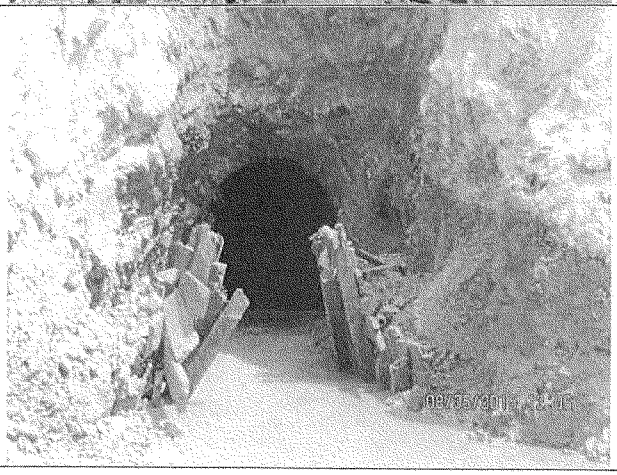


Photo No.	Date:
34	08/05/2015

Direction Photo Taken:

North

Description:
Closeup of adit.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
35	08/05/2015

Direction Photo Taken:

West

Description:
Excavator beginning work to secure safe exit route for equipment, vehicles, and personnel.

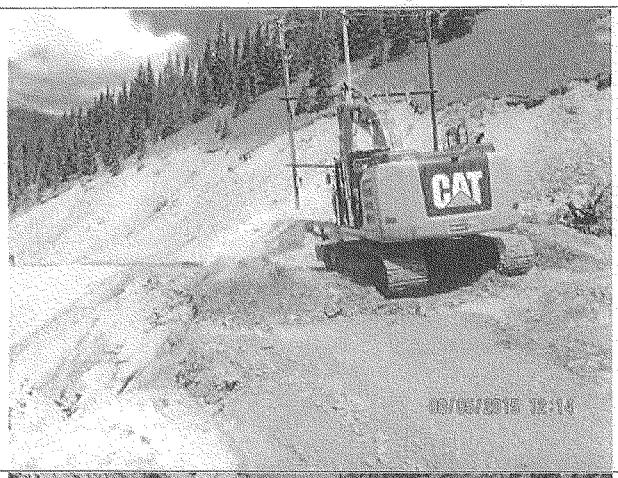


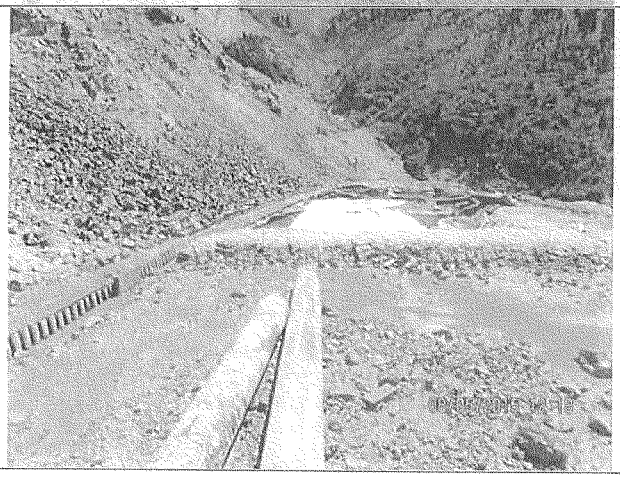
Photo No.	Date:
36	08/05/2015

Direction Photo Taken:

East

Description:

Existing flow channel at maximum capacity.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
37	08/05/2015

Direction Photo Taken:

Southwest/Down

Description:
Excavator progress on fixing access road to create a safe exit route.

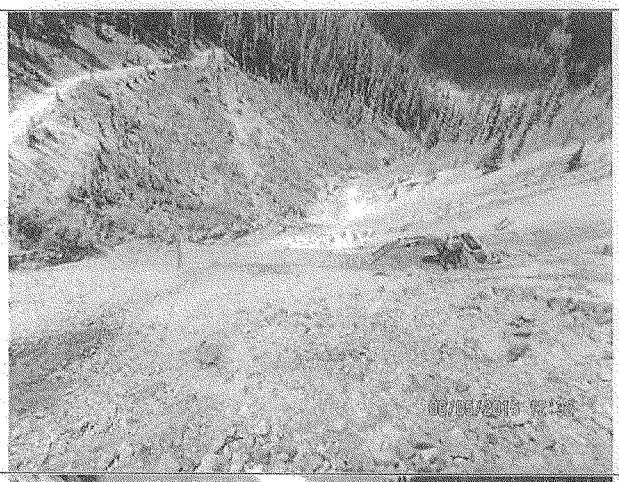
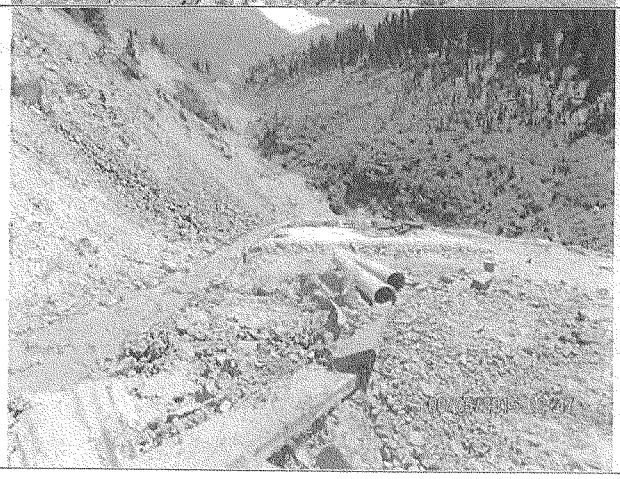


Photo No.	Date:
38	08/05/2015

Direction Photo Taken:

East

Description:
Existing culvert flows subsiding minimally.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
39	08/05/2015

Direction Photo Taken:

North

Description:
No changes visible in adit structure or supports. Sloughing of materials inside the mine can be heard.

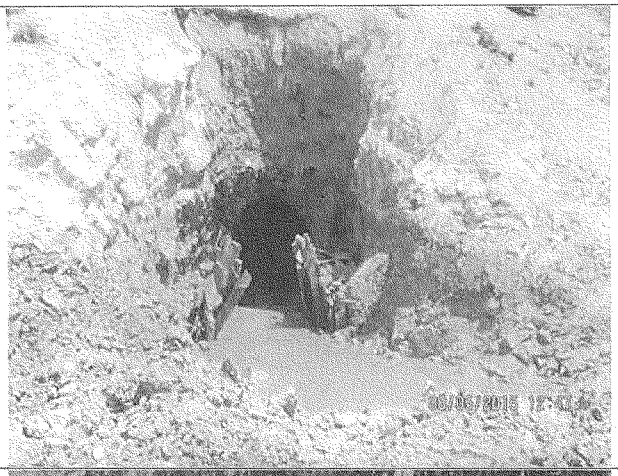
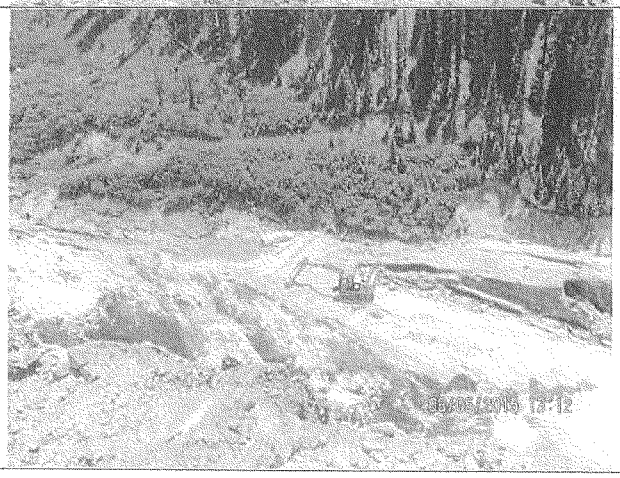


Photo No.	Date:
40	08/05/2015

Direction Photo Taken:

South/Down

Description:
Excavator progresses to washed out North Fork crossing.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
41	08/08/2015

Direction Photo Taken:

Southwest/Down

Description:
Noted visitor to the site, unknown person, walked up to excavator at North Fork creeking and then back to vehicle.

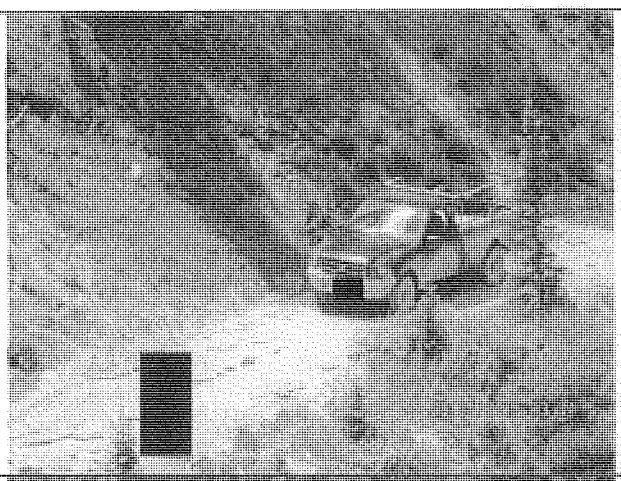


Photo No.	Date:
42	08/08/2015

Direction Photo Taken:

Southwest/Down

Description:
Visitor leaving.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
43	08/05/2015

Direction Photo Taken:

South/Down

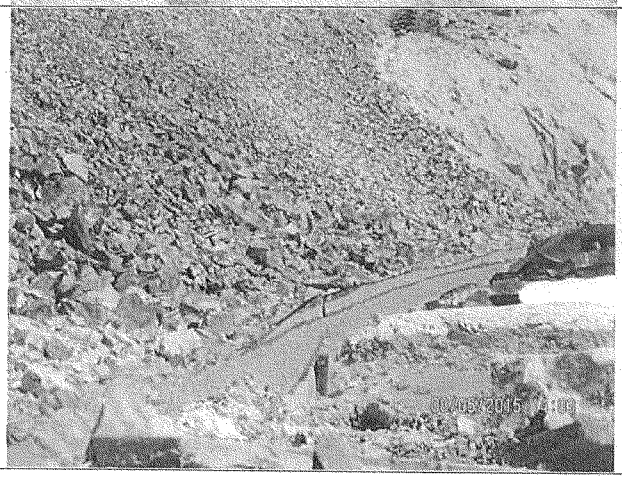
Description:
Excavator continues to fix access road. Continued high flow is slowing progress.

Photo No.	Date:
44	08/05/2015

Direction Photo Taken:

East

Description:
Half culvert flow continues to subside.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
45	08/05/2015

Direction Photo Taken:

North

Description:

Water levels lowering at adit entrance, no visible changes to structure.

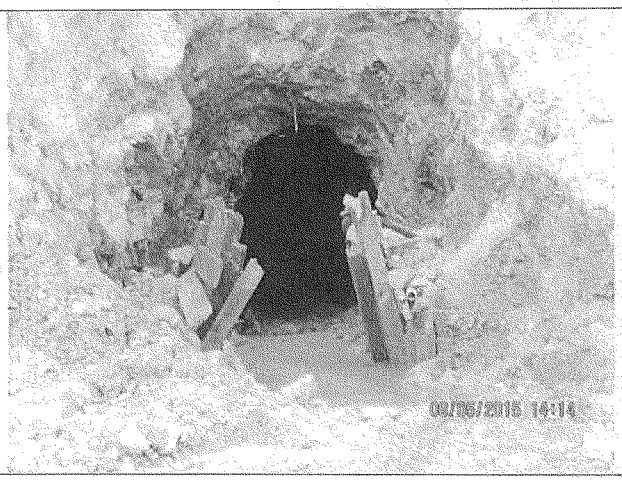
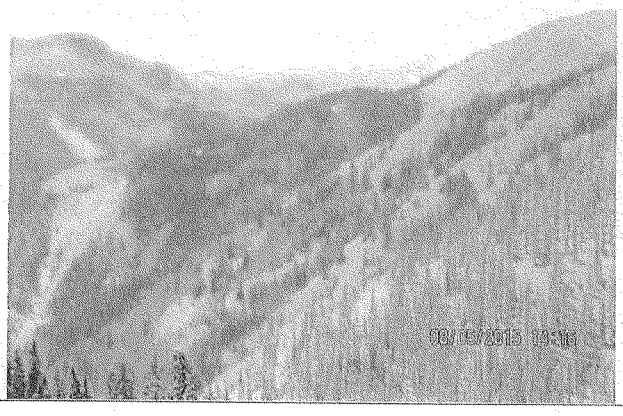


Photo No.	Date:
46	08/05/2015

Direction Photo Taken:

West

Description:
Flight for life Helicopter coming up the valley to pick up a person who crashed a vehicle on Corkscrew Pass, not related to this event.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
47	08/05/2015

Direction Photo Taken:

Southwest

Description:
Close up of Flight for Life.

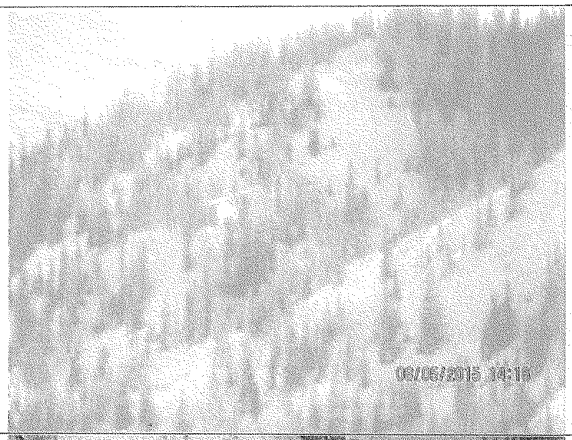


Photo No.	Date:
48	08/05/2015

Direction Photo Taken:

Northeast

Description:
Flow path from adit, water flow appears to have stabilized around 1400.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
49	08/05/2015

Direction Photo Taken:

North

Description:
pH measured at approximately 4.5.

Photo No.	Date:
50	08/05/2015

Direction Photo Taken:

Southwest/Down

Description:
DRMS arrives back on site, had visited the site around 0930 to check on progress of investigation, left approximately 1030, prior to blowout.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
51	08/05/2015

Direction Photo Taken:

North

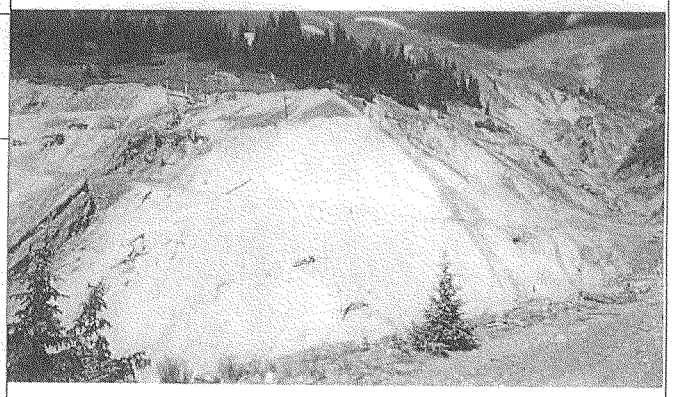
Description:
Looking up from the toe of the Gold King waste dump directly south of the adit.

Photo No.	Date:
52	08/05/2015

Direction Photo Taken:

Northeast

Description:
Gold King Mine tailings dump after water discharge.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine	Silverton, San Juan County, Colorado	0001/1408-01

Photo No.	Date:
53	08/05/2015

Direction Photo Taken:

East

Description:

Looking east across Cement Creek from County Road 10 to excavator fixing County Road 52 at North Fork crossing just south of Red and Bonita Mine.

Photo No.	Date:
54	08/05/2015

Direction Photo Taken:

East

Description:

Cement Creek crossing at Gladstone.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
1	08/06/2015

Direction Photo Taken:

Southwest

Description:

Animas River from U.S. Highway 550 southwest of Silverton

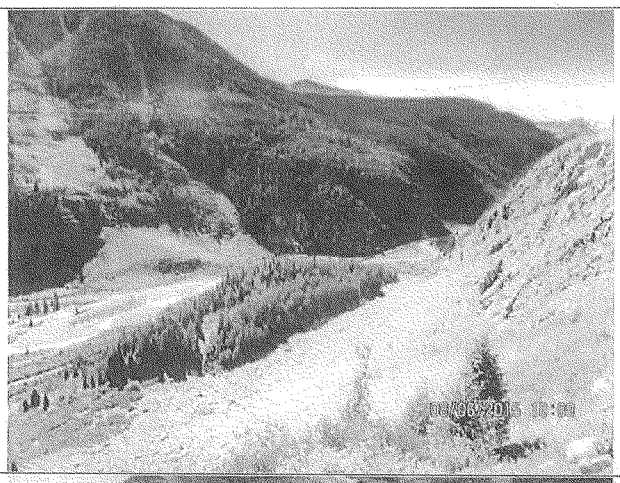


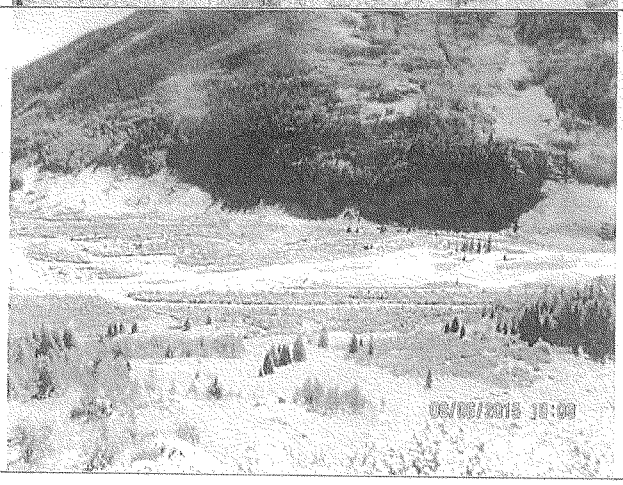
Photo No.	Date:
2	08/06/2015

Direction Photo Taken:

West

Description:

Animas River from U.S. Highway 550 southwest of Silverton



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
3	08/06/2015

Direction Photo Taken:

Northwest

Description:

Animas River from U.S. Highway 550 southwest of Silverton.

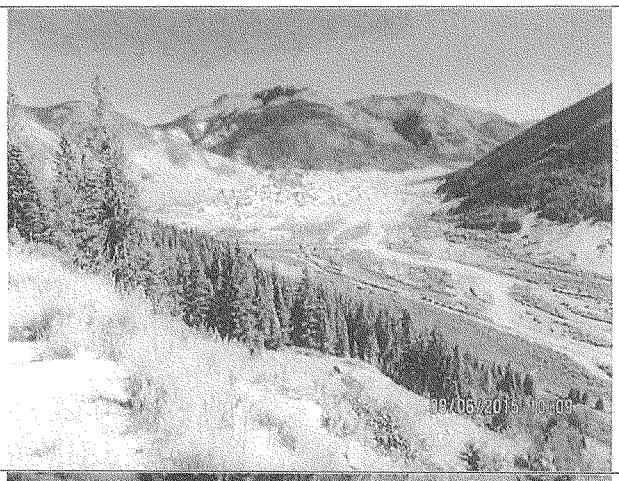


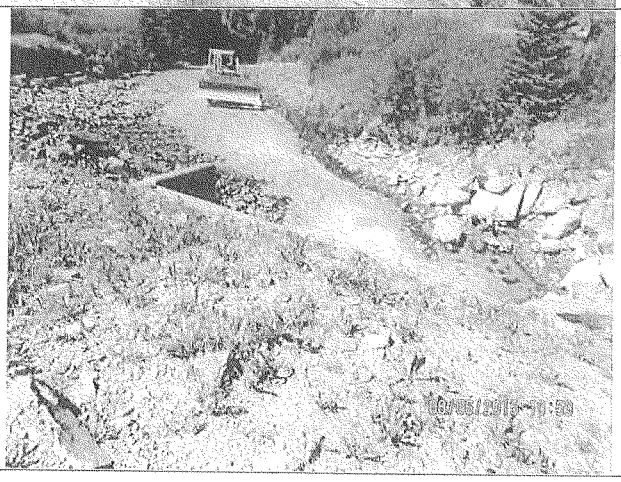
Photo No.	Date:
4	08/06/2015

Direction Photo Taken:

South

Description:

Repairing road damage along County Road 110 between Silverton and Gladstone.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
5	08/06/2015

Direction Photo Taken: South

Description:

Repairing road damage along County Road 110 between Silverton and Gladstone.

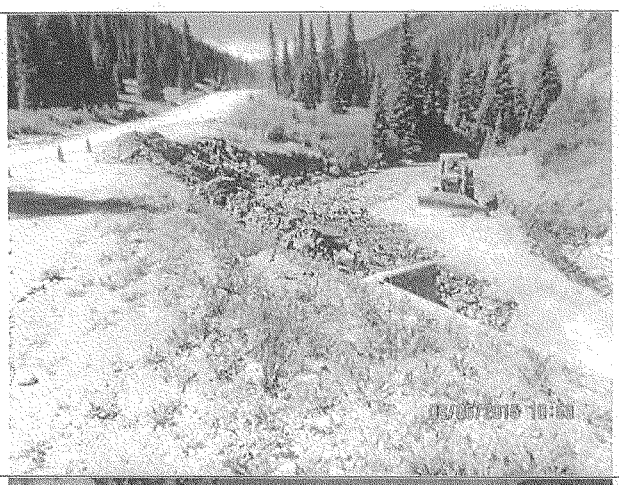


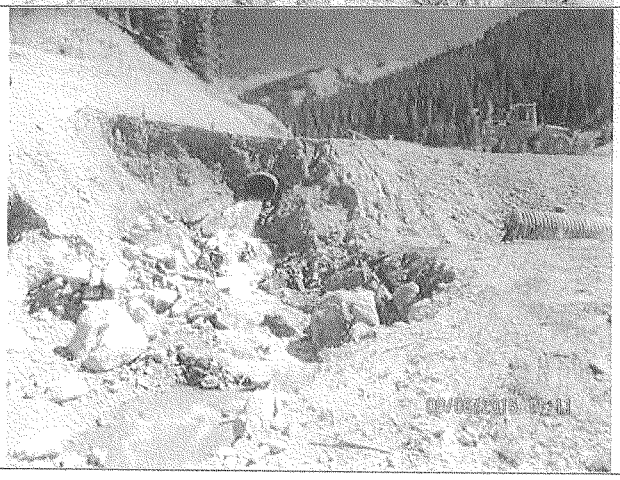
Photo No.	Date:
6	08/06/2015

Direction Photo Taken:

North

Description:

Road crossing over Cement Creek at Gladstone damaged, view from downstream.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Phot o No.	Date:
7	08/06/2015

Direction Photo Taken:

North

Description:

Upstream of Cement Creek culvert at Gladstone.

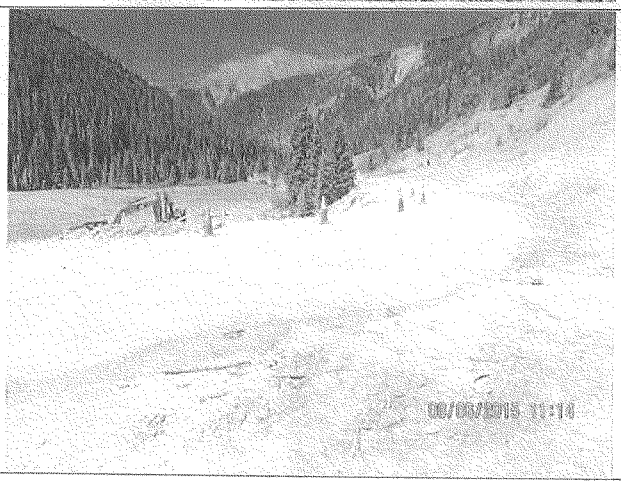
Photo No.	Date:
8	08/06/2015

Direction Photo Taken:

South

Description:

Road at Gladstone coned off.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
9	08/06/2015

Direction Photo Taken:

South

Description:

Cement Creek and North Fork convergence after Gold King discharge.

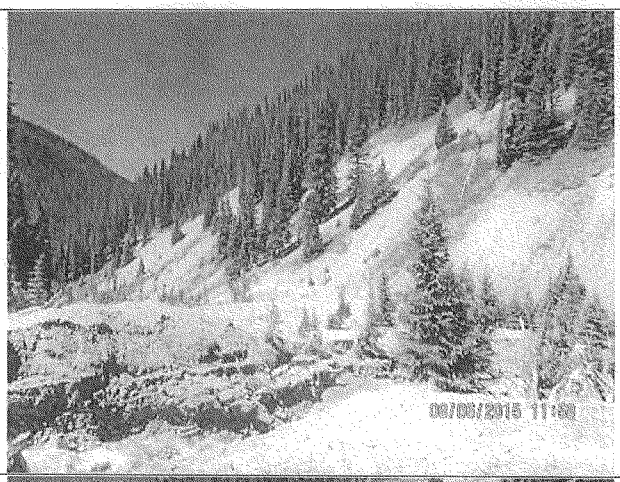


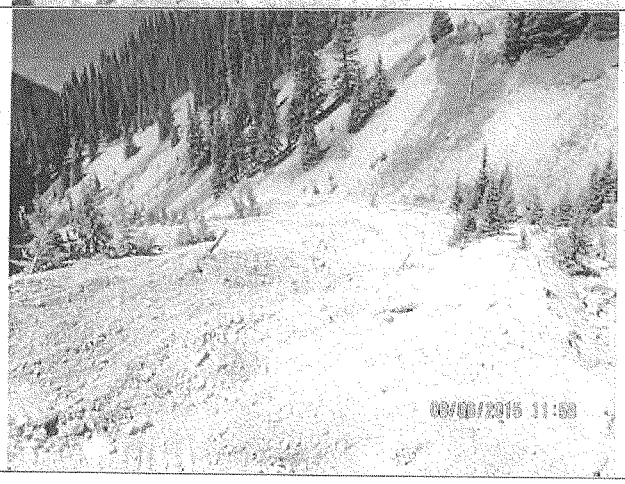
Photo No.	Date:
10	08/06/2015

Direction Photo Taken:

South

Description:

Cement Creek and North Fork convergence after Gold King discharge.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
11	08/06/2015

Direction Photo Taken:

East

Description:

Damaged GSA Suburban at base of Gold King mine dump

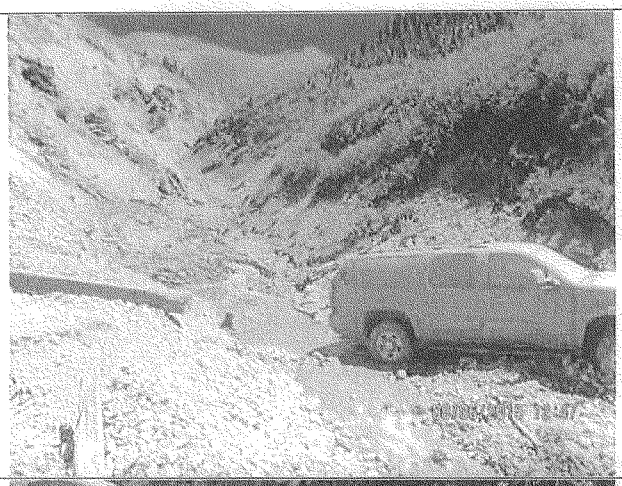


Photo No.	Date:
12	08/06/2015

Direction Photo Taken:

South

Description:

Temporary culvert for North Fork Cement Creek at road at base of Gold King mine dump.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
13	08/06/2015

Direction Photo Taken:

West

Description:

Temporary road crossing at base of Gold King mine dump.

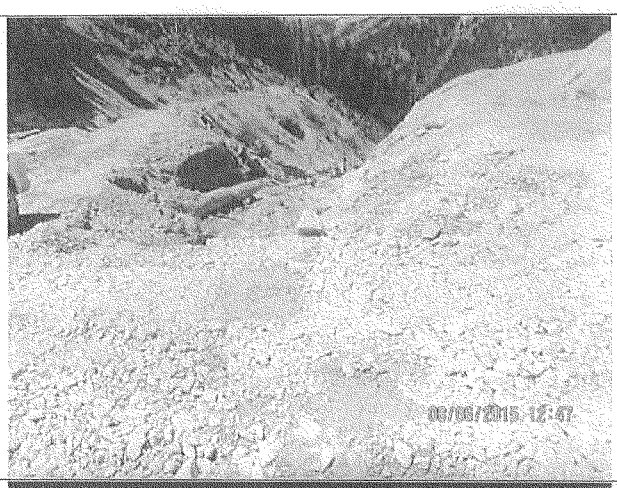


Photo No.	Date:
14	08/06/2015

Direction Photo Taken:

North

Description:

Gold King mine dump damage.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
15	08/06/2015

Direction Photo Taken:

West

Description:

Gold King mine dump damage.

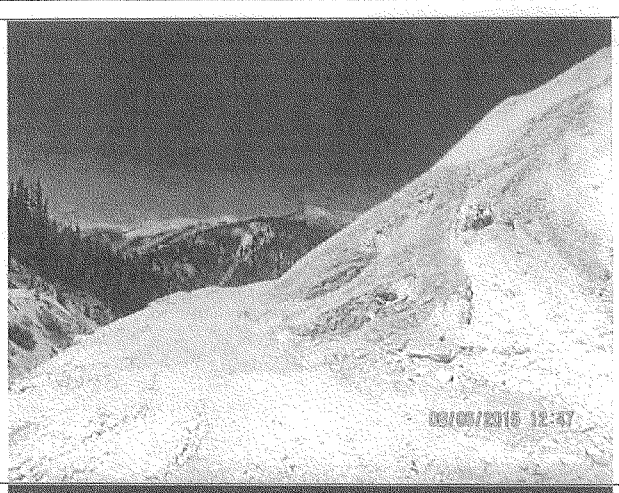


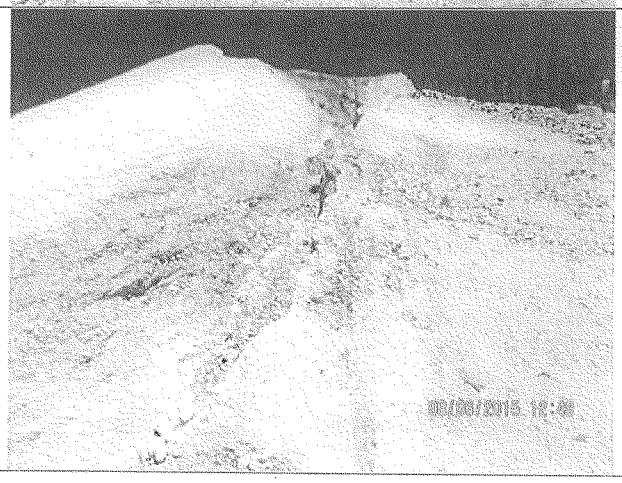
Photo No.	Date:
16	08/06/2015

Direction Photo Taken:

North

Description:

Gold King mine dump damage.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
17	08/06/2015

Direction Photo Taken:

Northwest

Description:

Gold King mine dump damage.

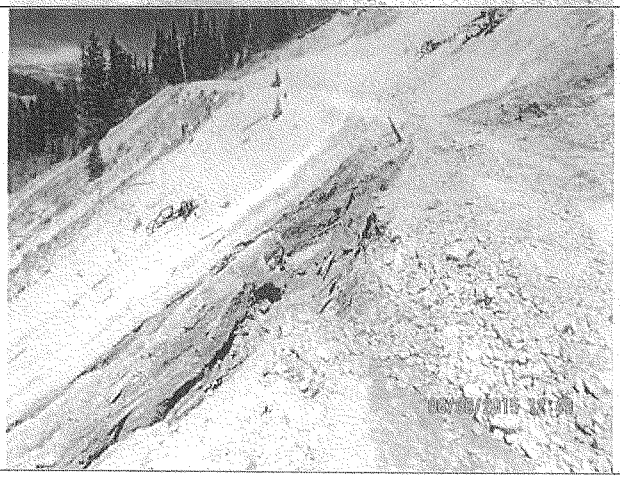
Photo No.	Date:
18	08/06/2015

Direction Photo Taken:

Northwest

Description:

Gold King mine dump damage.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
19	08/06/2015

Direction Photo Taken:

North

Description:

Gold King mine dump damage.

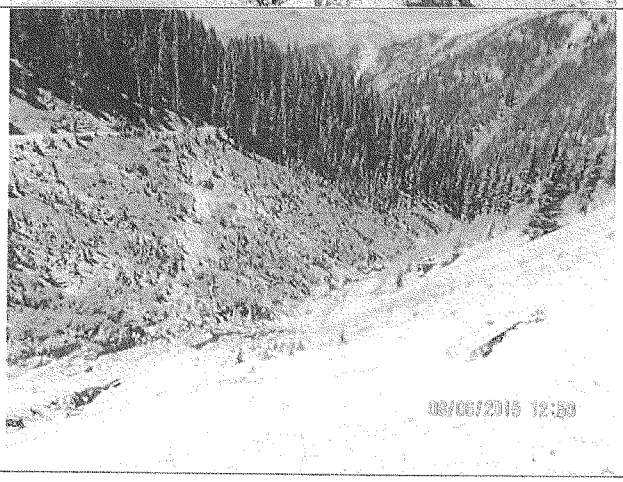
Photo No.	Date:
20	08/06/2015

Direction Photo Taken:

Southwest

Description:

North Fork Cement Creek downstream of Gold King road crossing. North Fork Cement Creek is orange.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
21	08/06/2015

Direction Photo Taken:

West

Description:

Switchback at the Gold King King access road.

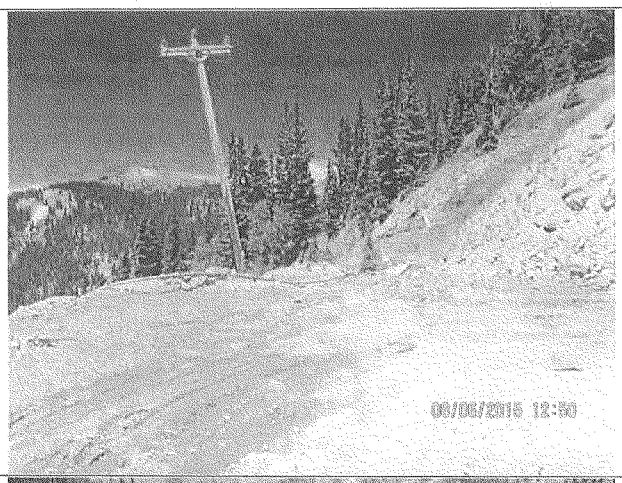


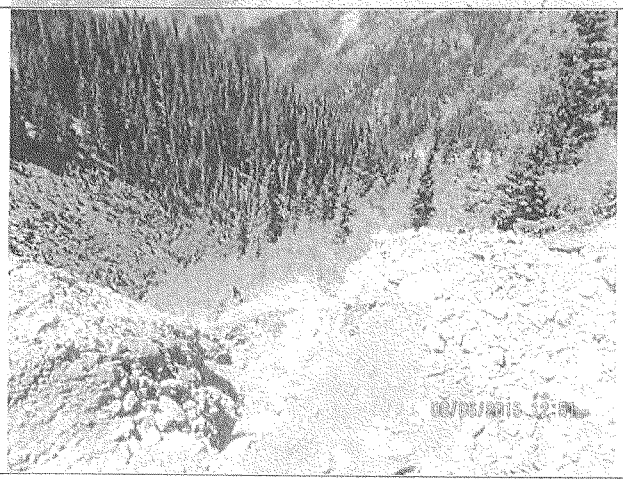
Photo No.	Date:
22	08/06/2015

Direction Photo Taken:

West

Description:

Gold King mine dump road damage.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
23	08/06/2015

Direction Photo Taken:

East

Description:

Gold King mine dump damage.

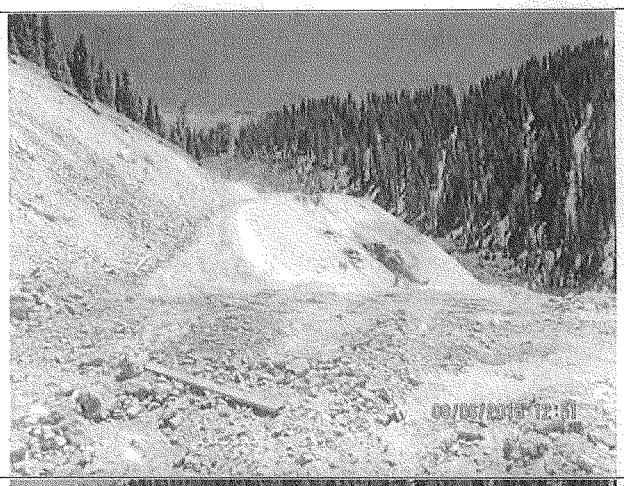


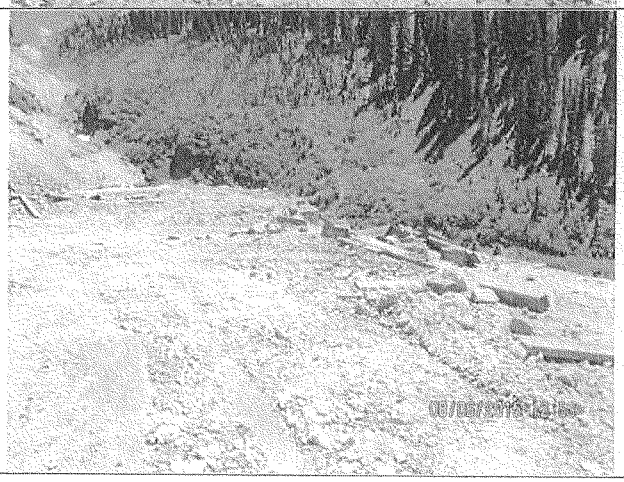
Photo No.	Date:
24	08/06/2015

Direction Photo Taken:

East

Description:

Top of Gold King Mine Dump.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
25	08/06/2015

Direction Photo Taken:

Northeast

Description:

Gold King adit post discharge.

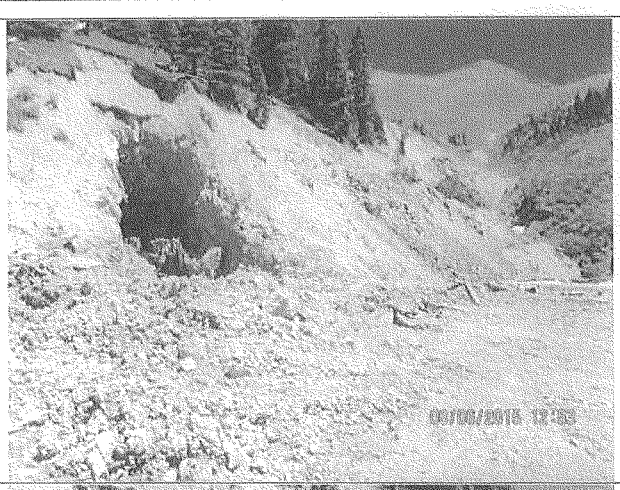


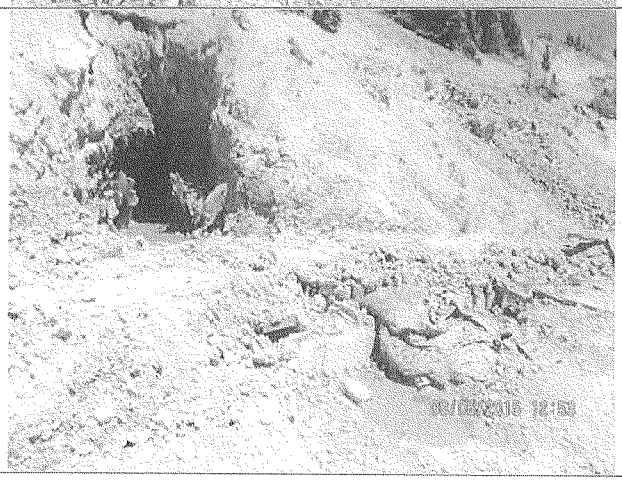
Photo No.	Date:
26	08/06/2015

Direction Photo Taken:

North

Description:

Gold King adit post discharge.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
27	08/06/2015

Direction Photo Taken:

North

Description:

Gold King adit

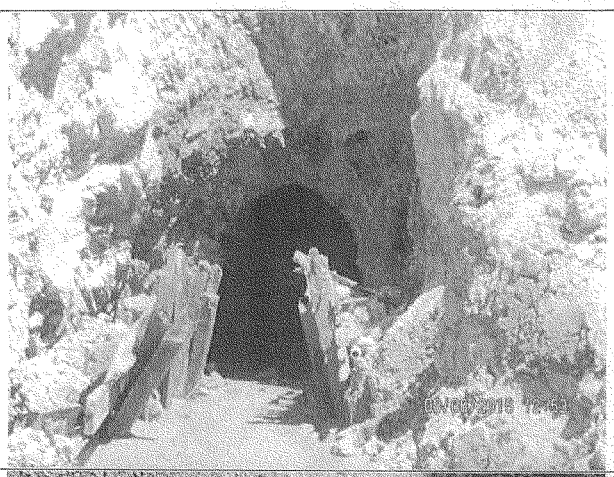


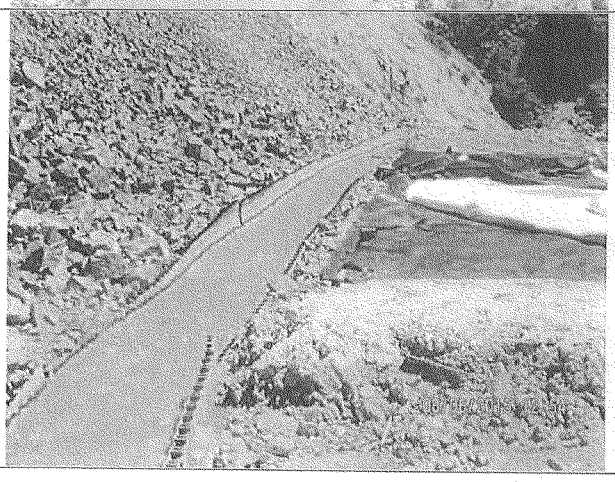
Photo No.	Date:
28	08/06/2015

Direction Photo Taken:

East

Description:

Channalized flow to edge of mine dump.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
29	08/06/2015

Direction Photo Taken:

West

Description:

Horiba Readings stabilizing in adit discharge. pH 3.41

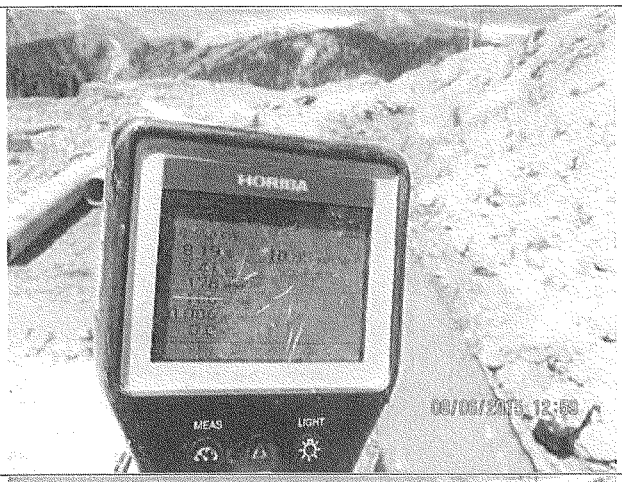


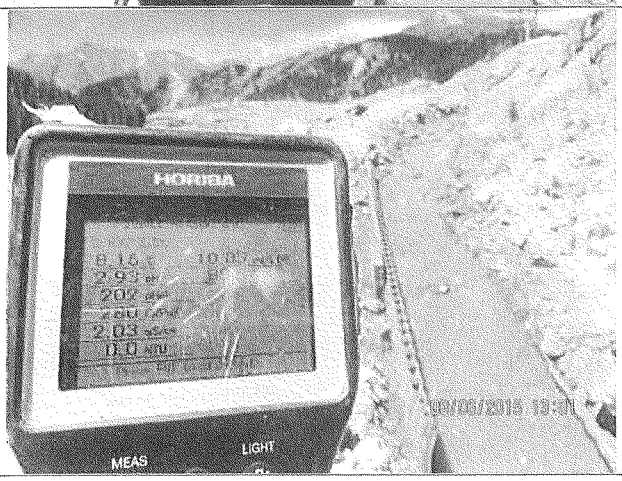
Photo No.	Date:
30	08/06/2015

Direction Photo Taken:

West

Description:

Stabilized Horiba readings (DO is not accurate). pH = 2.93 Turbidity too high for sensor reading so display shows 0 NTU.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
31	08/06/2015

Direction Photo Taken:

Northwest

Description:

Secondary sealed adit at Gold King, flow has decreased from 10's of gallons per minute to almost 0.

Photo No.	Date:
32	08/06/2015

Direction Photo Taken:

West/Down

Description:

Overview of the Gold King waste dump pad after mine discharge. Note orange water in half culvert channel and damage to center of pad.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
33	08/06/2015

Direction Photo Taken:

West

Description:

Overview of the Gold King Post mine discharge.

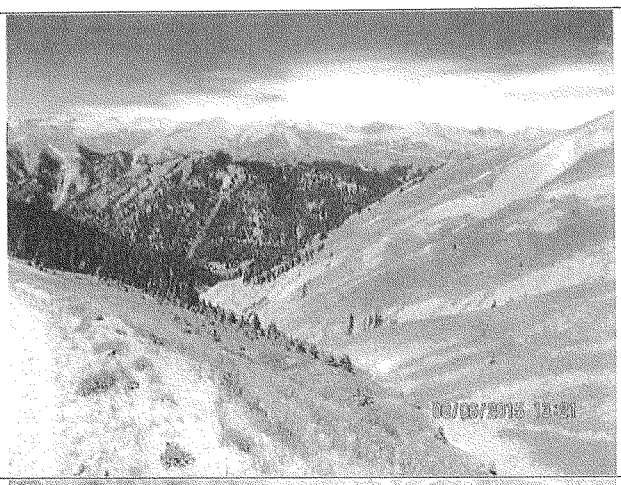


Photo No.	Date:
34	08/06/2015

Direction Photo Taken:

West and downhill

Description:

Overview of the Gold King mine dump after mine discharge.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
35	08/06/2015

Direction Photo Taken:

West/Down

Description:

Overview of the Gold King mine dump after mine discharge.

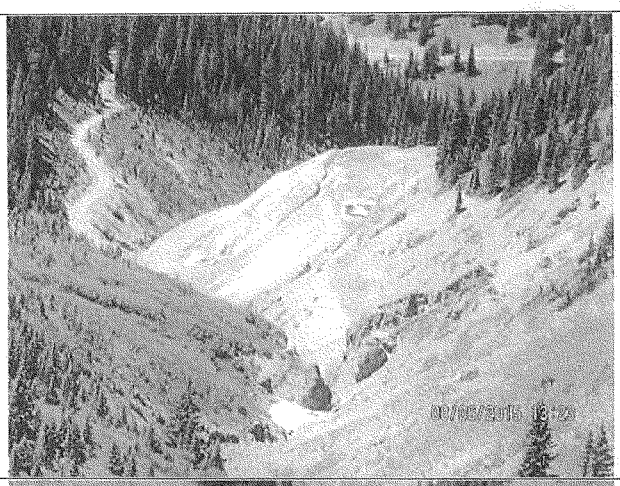


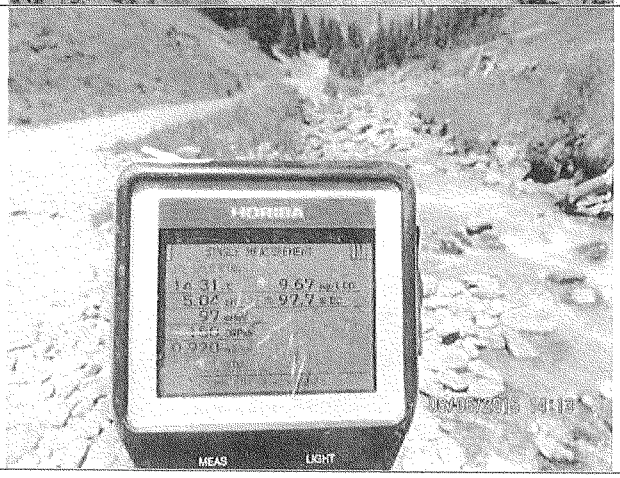
Photo No.	Date:
36	08/06/2015

Direction Photo Taken:

North

Description:

Horiba reading of Cement Creek upstream of North Fork confluence. Bad DO reading. pH = 5.04



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine ER	Silverton, San Juan County, Colorado	20408.012.001.0267.00

Photo No.	Date:
37	08/06/2015

Direction Photo Taken:

North

Description:

Stabilized Horiba reading of Cement Creek north of Gladstone culvert. Bad DO reading, pH = 2.98

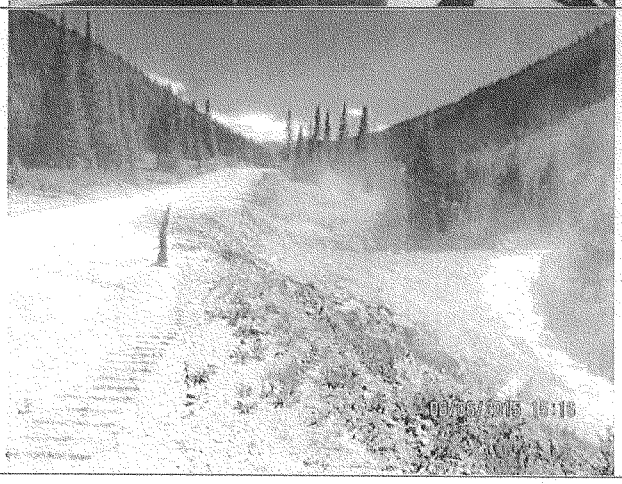
Photo No.	Date:
38	08/06/2015

Direction Photo Taken:

South

Description:

Updated view of road repair between Gladstone and Silverton.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
1	08/07/2015

Direction Photo Taken:

Southeast

Description:

Animas River morning of 8/7/15

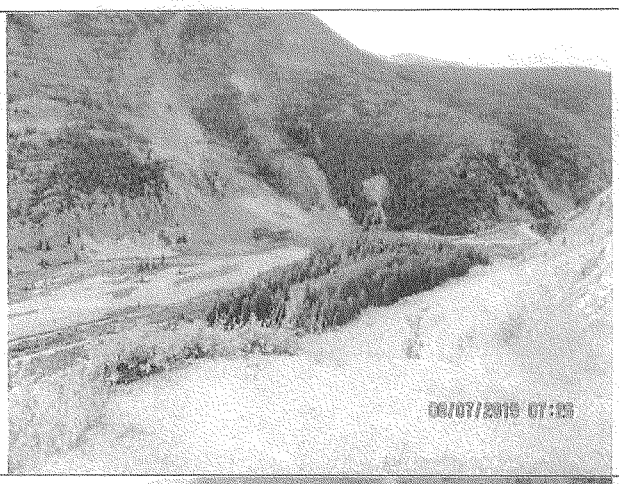


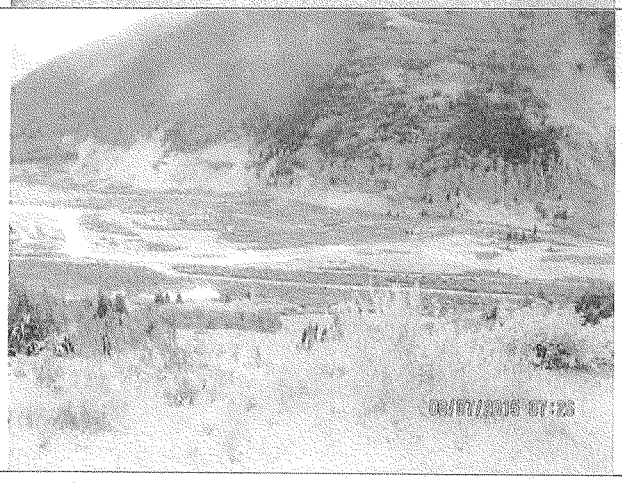
Photo No.	Date:
2	08/07/2015

Direction Photo Taken:

East

Description:

Animas River morning of 8/7/15



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
3	08/07/2015

Direction Photo Taken:

Northeast

Description:

Animas River morning of 8/7/15

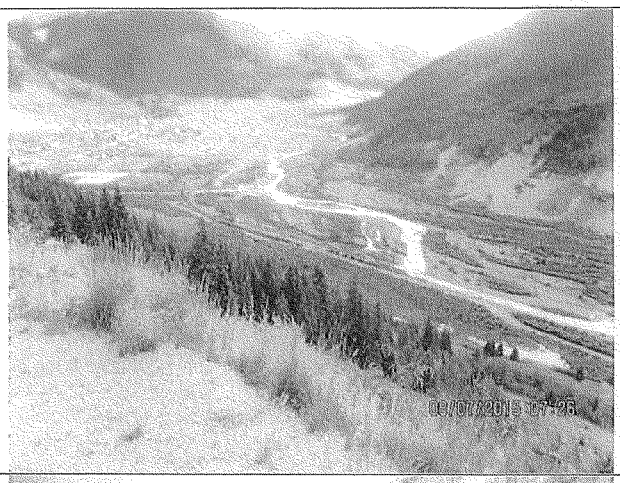


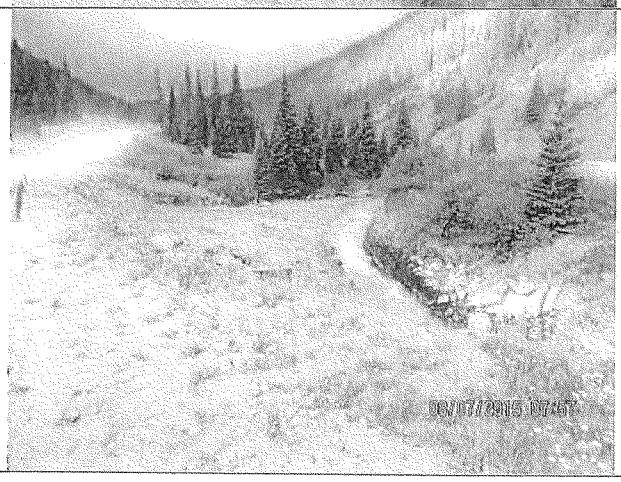
Photo No.	Date:
4	08/07/2015

Direction Photo Taken:

South

Description:

Road repairs between Silverton and Gladstone.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
5	08/07/2015

Direction Photo Taken:

East

Description:

Gold King Mine Dump and GSA Suburban.

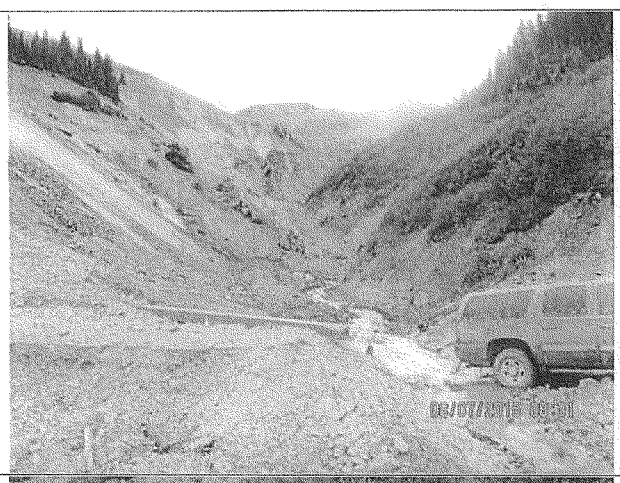


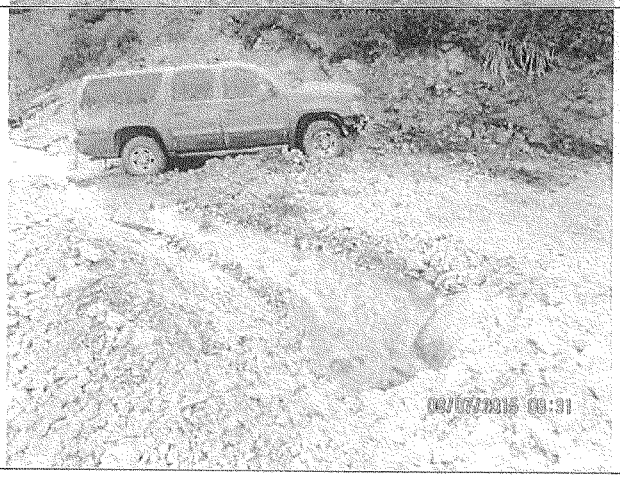
Photo No.	Date:
6	08/07/2015

Direction Photo Taken:

Southeast

Description:

GSA Suburban and water drain down to Cement Creek



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
7	08/07/2015

Direction Photo Taken:

North

Description:

Gold king Mine Portal the morning of 8/7

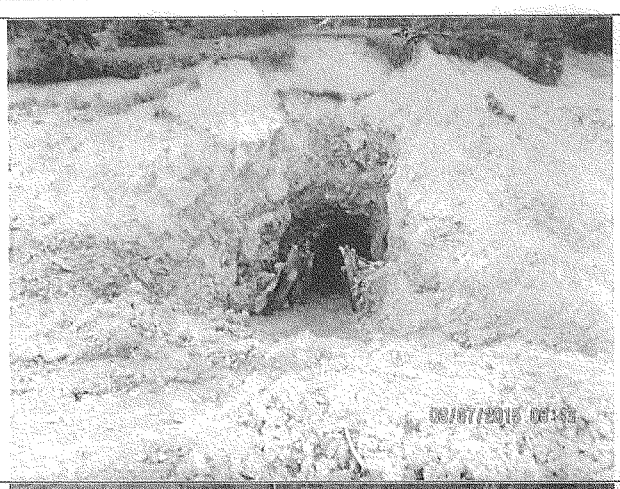


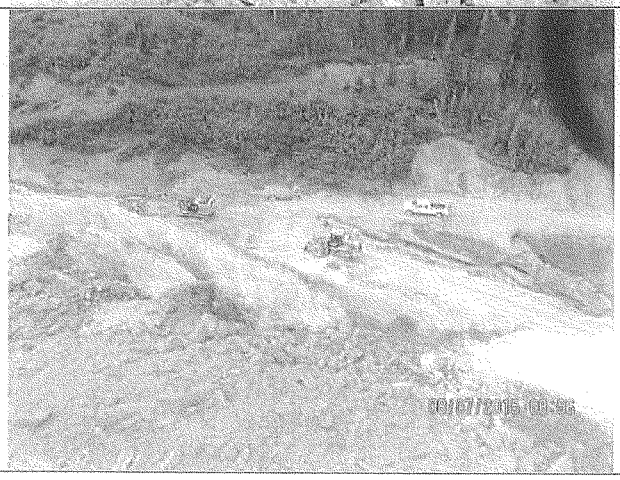
Photo No.	Date:
8	08/07/2015

Direction Photo Taken:

South/Down

Description:

Cleaning up suburban area and building settling pond.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
9	08/07/2015

Direction Photo Taken:

Northwest

Description:

Flow measure location for adit flow at the Gold King Adit.

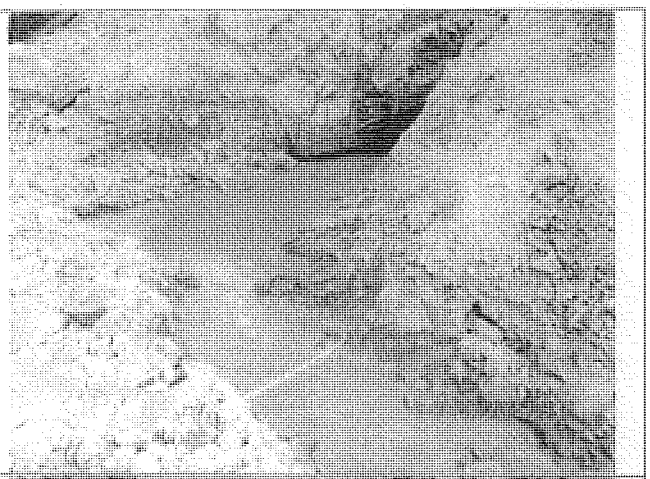


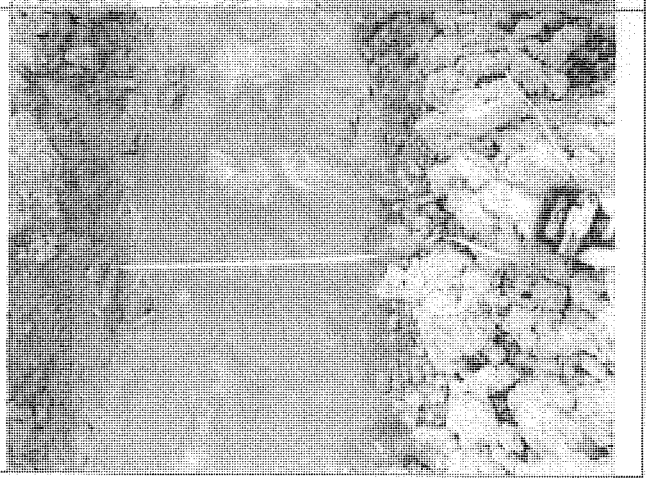
Photo No.	Date:
10	08/07/2015

Direction Photo Taken:

Down

Description:

Flow width = 3 ft.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
11	08/07/2015

Direction Photo Taken:

Down

Description:

Measuring flow with the Marsh-McBirney

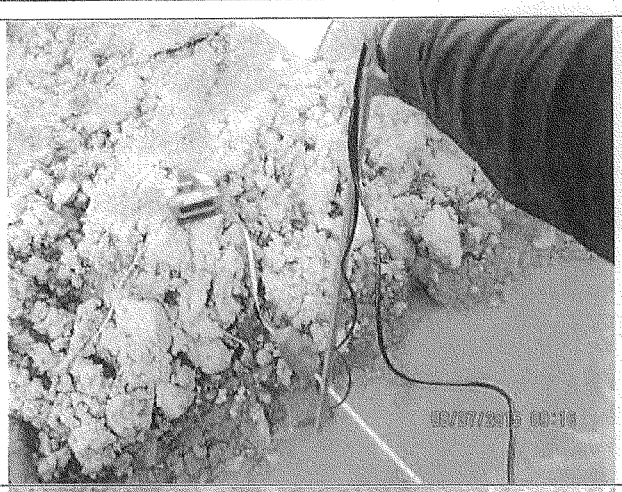


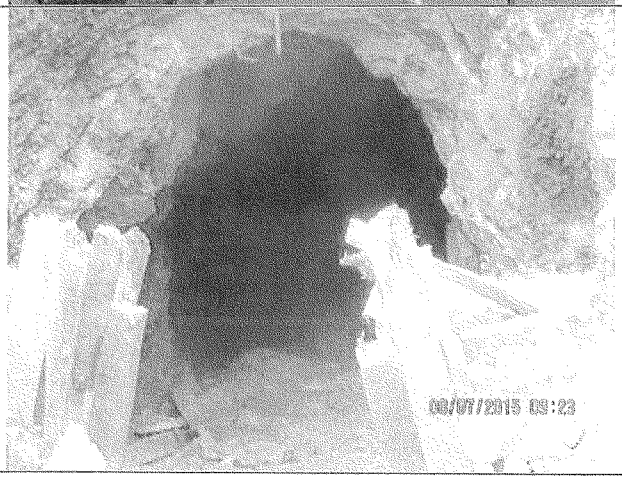
Photo No.	Date:
12	08/07/2015

Direction Photo Taken:

North

Description:

Close-up of the Gold King Mine Portal.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
13	08/07/2015

Direction Photo Taken:

Northwest

Description:

Gold King Adit pH = 2.97.

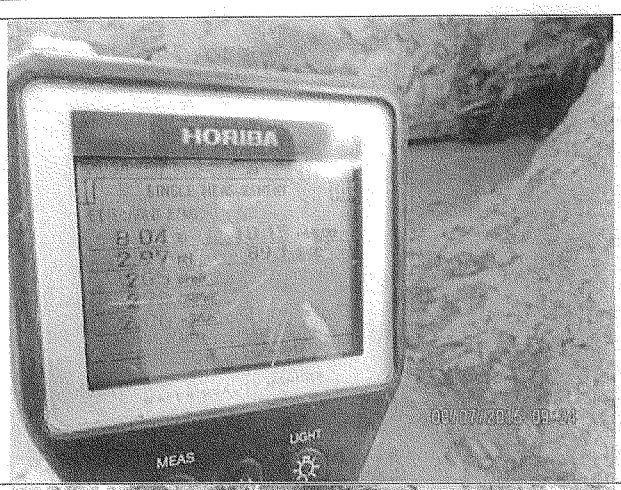


Photo No.	Date:
14	08/07/2015

Direction Photo Taken:

Northwest/Down

Description:

The historic adit for the Gold King has stopped flowing.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
15	08/07/2015

Direction Photo Taken:

South

Description:

GSA Suburban moved and runs, is undrivable due to service needs.

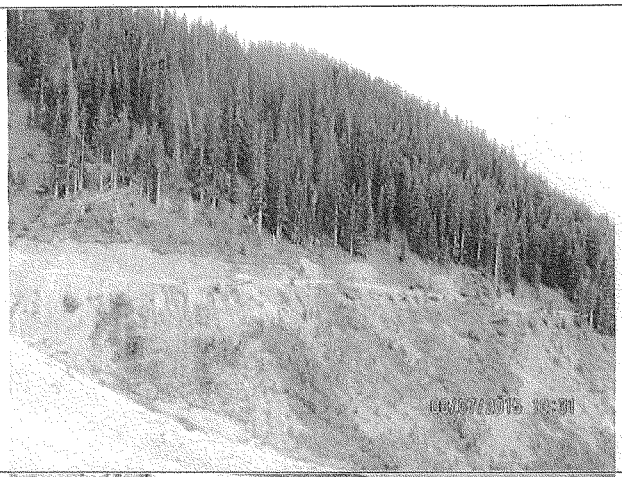


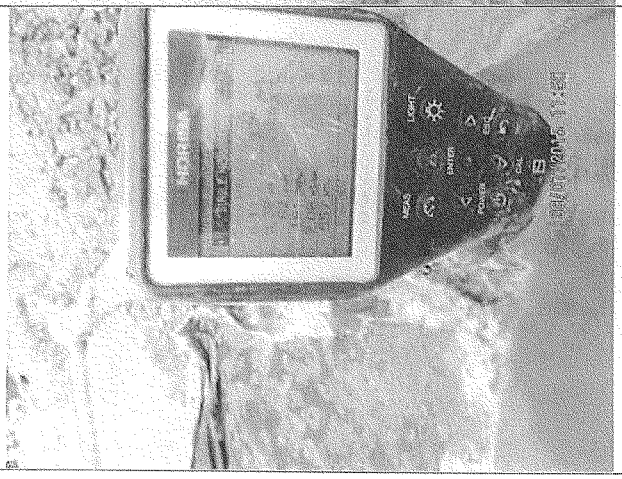
Photo No.	Date:
16	08/07/2015

Direction Photo Taken:

West

Description:

pH adjustment with 2 liters/minute of 25% NaOH, pH = 5.38



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
17	08/07/2015

Direction Photo Taken:

Southwest/Down

Description:

Water settling pond at base of the mine dump at Gold King.

Photo No.	Date:
18	08/07/2015

Direction Photo Taken:

Up

Description:

New helicopter fly over at Gold King.

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

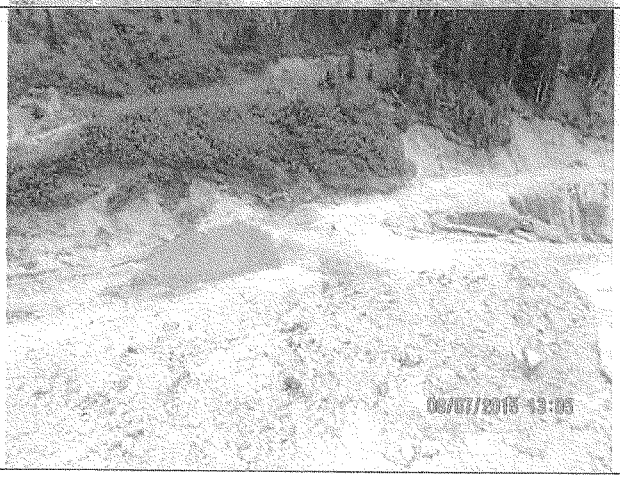
Photo No.	Date:	
19	08/07/2015	

Direction Photo Taken:

South/Down

Description:

Gold King treatment pond with building floc.

Photo No.	Date:	
20	08/07/2015	

Direction Photo Taken:

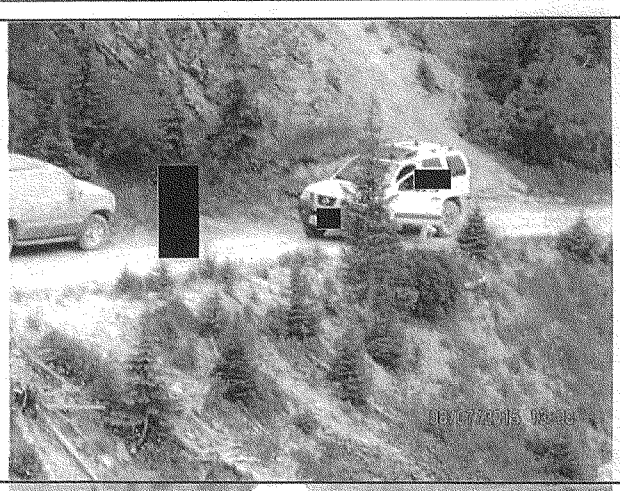
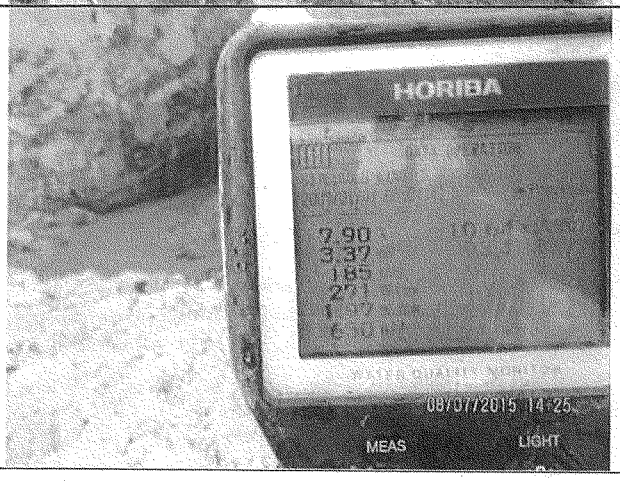
South/Down

Description:

Gold King treatment pond with building floc.

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:	Direction Photo Taken:	Description:	
21	08/07/2015	Southwest	Unknown visitor on-site.	
22	08/07/2015	West	Adit pH = 3.37	

WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
23	08/07/2015

Direction Photo Taken:

Down

Description:

Settling pong status.

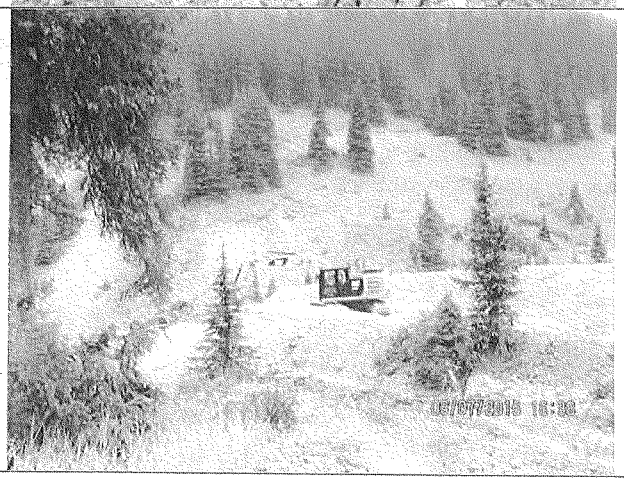
Photo No.	Date:
24	08/07/2015

Direction Photo Taken:

Northwest

Description:

Building ponds at Cement Creek and the North Fork.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

Photo No.	Date:
25	08/07/2015

Direction Photo Taken:

North

Description:

County Road 53 where North Fork crosses.

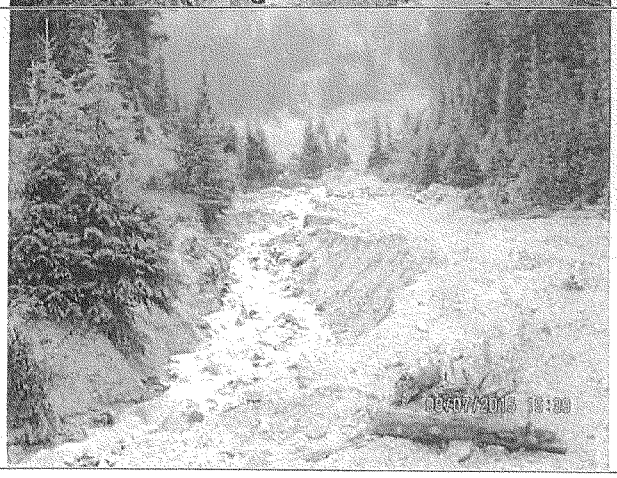
Photo No.	Date:
26	08/07/2015

Direction Photo Taken:

East

Description:

North Fork flow from Gold King.



WESTON SOLUTIONS

PHOTOGRAPH LOG

Project Name:	Site Location:	Project No.
Gold King Mine Blowout	Silverton, San Juan County, Colorado	ER

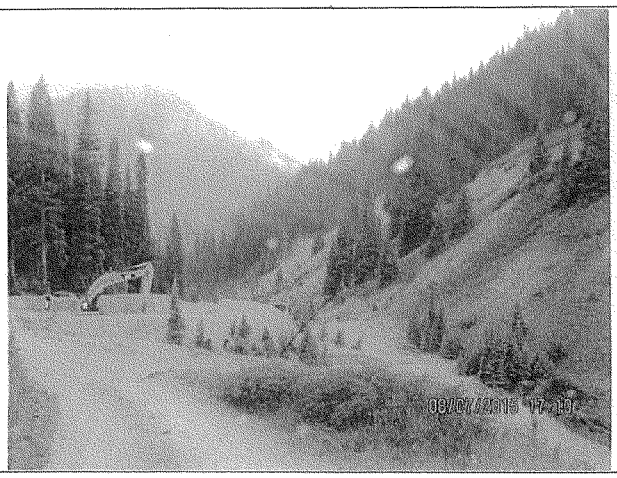
Photo No.	Date:
27	08/07/2015

Direction Photo Taken:

South

Description:

Pond progress at the convergence of Cement Creek and the north Fork.



SUMMARY REPORT

EPA Internal Review of the August 5, 2015 Gold King Mine Blowout
8/24/2015

Purpose:

The purpose of this report is to provide the EPA Internal Review Team's (Team) assessment of the events and potential factors contributing to the blowout from the Gold King Mine (GKM) in Colorado on August 5, 2015. This report provides the Team's observations, conclusions, and recommendations that regions may apply to ongoing and planned site assessments, investigations, and construction or removal projects at similar types of sites across the country.

Team Charge:

The Assistant Administrator of the Office of Solid Waste and Emergency Response (OSWER) charged a subgroup of the National Mining Team on August 14, 2015 to conduct a rapid analysis of the Gold King Mine (GKM) release and provided them with the following charge:

The EPA Gold King Mine Internal Review Team (Team) is charged with conducting an internal review of the August 5, 2015, release of approximately 3,000,000 gallons of mine wastewater from the Gold King Mine near Silverton, CO. This review will entail developing a detailed, chronological description of events as well as identifying potential factors contributing to the release. The review may include recommendations that regions may apply to ongoing and planned site assessments, investigations, and construction or removal projects. The review will include:

- *A visit, during the week of August 16, 2015, to the Gold King Mine site to observe post-August 5 site release conditions.*
- *Interviews with the on-site EPA On-Scene Coordinator and other appropriate EPA staff, appropriate contractor representative(s) (e.g., Emergency Response and Rapid Services [ERRS], Superfund Technical Assessment and Response Team [START] contractor), and others, e.g., State, other Federal agency/departmental personnel, as appropriate, to document their recollections of the event. Interviews shall not interrupt response.* [See Attachment B for a list of people interviewed.]
- *Interviews to be conducted using guidelines to be included in a briefing from the Office of the General Counsel.*
- *Review of pertinent site documentation, (e.g., work plan, schedule, quality assurance response form, other pertinent technical/engineering/contractual documents/any photographic records) to identify potential factors contributing to the release.*

- *Potential coordination with the subsequent external review being conducted by the US Department of Interior/Bureau of Reclamation and US Army Corps of Engineers thereby minimizing the impact to response operations.*
- *Any recommendations to implement at similar sites, both ongoing and new, based on the results of the Team's review.*

A senior manager from OSRTI will be identified to facilitate the identification of individuals to be interviewed, agencies to engage, etc. The Team will develop a preliminary report addressing the information above and deliver it electronically to the OSWER Assistant Administrator by Monday, August 24, 2015. If necessary, the team may also indicate if additional gaps need to be filled, and the timeframe it would take to fill those gaps.

Scope of Team Review:

The Team was asked to conduct a one week rapid assessment of the GKM Blowout. From August 15 to August 24, 2015, the Team performed a site visit, interviewed key individuals, reviewed available information, and drafted a report.

EPA's Internal Review Team consisted of the following: individuals:

John Hillenbrand, CEG, EPA Region 9 – Team Leader
Joshua Wirtschafter, Assistant Regional Counsel, EPA Region 9
Ed Moreen, P.E. Civil, EPA Region 10
Lisa Price, Geologist, EPA Region 6
Shahid Mahmud, Environmental Engineer, EPA Headquarters

The following are the attachments included in this report:

Attachment A: List of documents reviewed by the Team
Attachment B: List of interviewees
Attachment C: Map of Mine Workings
Attachment D: Working Assumptions Diagram of conditions at new Gold King Mine Level 7 Portal
Attachment E: Gold King Mine Flow Data and Chart
Attachment F: Report Photos
Attachment G: Photo log from 2014 and 2015 Removal Investigation activities

In addition, the Team conducted a limited review of internet resources to determine if there are existing guidelines or procedures for investigating sites with similar characteristics as this site.

Background Information:

The following is the chronology of pertinent site events.

1880's – The Gold King Mine began operation.

Mid-1900's – The Gold King Mine operations ceased; mining had occurred at seven (7) different elevations (levels) through three (3) adits: the Level 7, Number 1, and Sampson. Historical mine water levels could not be ascertained by the team during the review period.

Mid-1900's -- The American Tunnel was constructed below the lowest mine workings in the area (Attachment C: Map of Mine Workings). It runs from the drainage adit discharge point in Gladstone, beneath the Gold King Mine and eventually reaches the Sunnyside mine complex approximately two (2) miles northeast. During operation of the American Tunnel it effectively drained the Gold King and Red and Bonita Mines. It passes 500 feet directly beneath the Gold King Mine Level 7 adits. Anecdotal information puts construction in the early to mid-1900's. A treatment plant was constructed to treat the water from the tunnel prior to release to Cement Creek. The date of construction of both the water treatment plant and the American Tunnel could not be ascertained during the review period.

1986 – A permit was issued to the Gold King Mines Corporation (Permit Number M-1986-013) by the state of Colorado to re-work the historic interconnected adits. During the permitted mine operations, another adit was driven at the Gold King Level 7 (the Adit) to bypass a collapse in the original Gold King Level 7 Adit (the Old Adit).

2002 – Treatment of the discharge water from the American Tunnel ceased after installation of the last bulkhead. Flow from the American Tunnel continued after the installation of the bulkhead at approximately 100 gallons per minute (gpm). Since closure of the American Tunnel, the water quality in the Animas River has degraded progressively due to the impact of drainage from the American Tunnel and other newly draining adits.

2005 – No documentation of flow for the Adit is available before July 2005. Anecdotal information suggests that the Red and Bonita Mine, which did not have any previously documented mine water discharge, began releasing approximately 300 gpm of water after the American Tunnel closure. The Adit also experienced an increase after the American Tunnel closure from no significant flow to flow rates of approximately 42 gpm in July and 135 gpm in September[1]. (See Attachment E: Gold King Mine Flow Data and Chart)

2006 – Mine water flow rate from the Adit was approximately 314 gpm[1] in October.

2007 – Release of mine water from the Old Adit breached the existing discharge ditch and saturated the mine waste pile. The saturated conditions led to a slope failure that partially blocked access to the site and filled the North Fork of Cement Creek with mine waste. The quantity of mine water discharged is not known.

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[1] The Team could not ascertain in the time allowed if flow rates represent composite for both the Old Adit and the Adit or just the Adit

2008 – The Colorado Division of Reclamation, Mining & Safety (DRMS) constructed a discharge diversion structure (flume channel) to prevent future mine water saturation of the Gold King Level 7 mine waste pile at the Old Adit. This work was paid for by the forfeiture of the bond associated with the permit issued in 1986, M-1986-013.

2009 – The DRMS's Gold King Mine Reclamation Plan called for all four (4) adits of the Gold King complex to be backfilled and the installation of a flume to divert the discharge. The two (2) Gold King Level 7 adits (Adit and Old Adit) were partially collapsed already but additional closure work was conducted. This work was paid for by the forfeiture of the bond associated with the permit issued in 1986, M-1986-013. DRMS stated in the project summary for the activities that "[a] future project at the site may attempt to cooperatively open the Level 7 Old Portal in an effort to alleviate the potential for an unstable increase in mine pool head within the Gold King workings." The Old Adit was releasing roughly 200 gpm.

2010 – The average mine water flow rate from the Gold King Level 7 mine was 206 gpm[1].

2011 – The average mine water flow rate from the Gold King Level 7 mine was 140 gpm[1].

2014 – EPA planned to expose the Adit in 2014 – EPA was working with DRMS and the Animas River Stakeholder Group (ARSG), which is composed of industry, agency and citizens including former miners and equipment operators who have worked on some of the mine adit closures in the area of Gold King, to identify actions that may be needed to reduce contaminant loading to Cement Creek and downstream waters. This included a plan to install bulkheads at the Red and Bonita Mine. It was determined appropriate to attempt to open the Adit prior to restricting flow at the Red and Bonita Mine with a bulkhead and potentially changing the water level elevations in the Red and Bonita Mine. To accomplish this objective, EPA planned to expose the Adit behind the external blockage, build a portal structure, and convey Adit flows into the existing channel (see Attachment D). This was being done to allow access for further investigation of the Adit. The flow rate data from the Gold King Level 7 mine was approximately 112 gpm in August, 2014, however, on September 11, 2014 prior to the beginning of site work, the flow rate was less than 13 gpm.[1]

A retention pond was constructed to capture solids that might be released during the Adit work. On September 11, work began to remove the material that was blocking the Adit. The excavation extended approximately 20 feet into the Adit entrance. The work stopped when it was determined that the elevation of the Adit floor was estimated to be six (6) feet below the waste-dump surface elevation. EPA determined that Adit drainage would need to be managed in a larger settling pond(s) requiring additional treatment.

The excavation in 2014 revealed that two (2) 24-inch pipes were in the tunnel blockage adjacent to the top (roof) of the maximum 10 foot tall Adit. (See Diagram in Attachment D). The presence of water below the two (2) 24-inch pipes indicated the current flow of water was coming out at least four (4) feet below the roof of the Adit, indicating approximately six (6) feet of impounded water above the estimated Adit floor elevation.

On September 12, two (2) drain pipes were placed at the base of the blockage to capture the on-going mine water drainage and direct flow into the existing flume channel installed in 2008 by DRMS. Geo-fabric, crushed rock, and quick-dry concrete was used to secure the pipes in place. The Adit area was backfilled and compacted with additional loads of crushed rock to maintain a stable surface at the Adit for potential future work. Field work was suspended for the rest of the year.

2015 – Based on information acquired in 2014, EPA, again, planned to reopen the Adit and workings to investigate the conditions to assess the ongoing releases of mine water. This would require incremental de-watering and removal of internal blockages that were preventing the release of impounded water. A secondary purpose of the work is to attempt to gain access to the mine workings and to mitigate flows, if possible.

In January and May, 2015, the ARSG held meetings, open to the public, where DRMS and EPA presented their plans for removal investigation at the Adit. The Meeting Summaries posted by ARSG do not record any stakeholder criticism of the planned approach.

EPA returned to the Adit in late July, initiating site preparations with reconstruction of the access road and installation of an alternative mine drainage pipe at a deeper depth in anticipation that the Adit floor is lower than the other drainage pipes installed in 2014.

On August 4, excavation began above the top of the Adit to remove consolidated soils and debris. The goal was to find competent bedrock within which to anchor a support structure for the Adit. During this first day of excavation, according to the OSC, mine timbers and the external Adit blockage were newly exposed

On August 5, excavation resumed. The OSC observed a solid rock surface and constructed a ramp above the external Adit blockage to remove soil from the bedrock surface. During the excavation, the lower portion of the bedrock face crumbled away and there was a spurt of water from the area in the lower part of the excavation area. Shortly after the water spurted, more water started coming from the localized area of the spurt. The color of the water was initially clear but then changed to red/orange. The OSC speculated that the excavation might have knocked something lose when removing the soils from the rock face.

The time lapse between the spurting to the flow of red/orange water was 3 to 4 minutes. It took approximately 1 hour for the peak flow to subside.

Observations Related to the Release:

The Team interviewed key personnel involved with the Adit blowout from EPA Region 8 on August 17, 2015, to document their recollections of the event and to get pertinent site documents and other information on the site. EPA Region 8's personnel provided a package of key site-related documents, pictures of the site, and site diagrams. On August 18, 2015, the lead OSC from Region 8 led a site visit of the Gold King Mine. Senior mining experts from the DRMS also participated in this site visit. The Team asked the State experts about their understanding of the site and recollection of the events at the Adit and the upper Animas River mining district.

The August 18 tour included stops at: the American Tunnel entrance with an explanation of the underground working by DRMS; the road above the series of ponds that treat the post-blowout drainage from the Adit (see Appendix F, photo 1); the Gold King Mine area; and both the Old Adit and the Adit. No stop was made at the Red and Bonita Mine (Appendix F photo 2 and Attachment C, map of workings).

In addition to bringing an understanding to the chronology of events listed above, the site visit and work plan provided the following supplemental information:

- The work plan accounted for the possibility of pressurized (mine water with a head high enough to cause water to exit the Adit at high velocity) mine water conditions. In the introduction, the work plan states:

  > "Conditions may exist that could result in a blow out of the blockages and cause a release of large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals."

- The work plan outlined the steps to be taken such as gradually lowering the debris blockage and the use of equipment (stinger) that would help control drainage from the mine under non- or slightly pressurized conditions. A stinger is a metal pipe that is inserted from above the top of the mine adit front at an angle, through the debris and collapse blockage into the void behind the blockage, allowing drainage and control of mine water.

- For the Adit, a determination of no or low mine water pressurization was made by experienced professionals from EPA and the DRMS. Based on discussions with the EPA and State people associated with the site, this determination was based on the following conditions:

  1. The hill above the Adit was inspected for seeps which would have indicated outward flow from mine water that had a pressure head above the top of the Adit. It was reported that there were no seeps.
  2. The mine was draining, which indicated that since water was able to escape, buildup of pressure was less likely.
  3. The DRMS experts, [redacted] who supported the removal investigation, had worked in the area for years, were familiar with the site and knew the details of the operation and area hydrology
  4. The Animas River Stakeholders Group (ARSG) had been given a presentation by [redacted], EPA's On-Scene Coordinator (OSC), and [redacted] with DRMS, as documented in the May ASRG Meeting Summary.
  5. The DRMS experts supported the removal investigation at the Adit and were present at the site during the operations on August 4 and 5.
  6. The "seep" level coming from the Adit during excavation seemed to be at the mid-level of the material blocking the Adit, indicating a partially filled adit as opposed to a pressurized one (See Attachment D, bottom of two metal pipes).

7. The Red and Bonita Mine Adit was lower in elevation (a few hundred feet) and found to be unpressurized after it was accessed by drilling from above.
8. The DRMS experts indicated that similar techniques have been employed at other similar mine sites. One DRMS expert noted that a similar investigation technique was implemented at the Captain Jack Mine in Colorado but did not result in a blowout.

- Despite the available information suggesting low water pressure behind the debris at the Adit entrance, there was, in fact, sufficiently high pressure to cause the blowout. Because the pressure of the water in the Adit was higher than anticipated, the precautions that were part of the work plan turned out to be insufficient. The inability to obtain an actual measurement of the mine water pressure behind the entrance blockage seems to be a primary issue at this particular site. If the pressure information was obtained, other steps could have been considered. However, the Team cannot determine whether any such steps would have been effective, or could have been implemented prior to a blowout.

- Mine water pressurization data from behind the blockage potentially could have been obtained through a drill hole inserted further back into the Adit from above the mine tunnel. Such a technique was performed at the nearby Red and Bonita Mine and found no pressurization. Consequently, it was determined that the tunnel was not full of water and excavation of the Adit at that mine could proceed. Such a technique was not used at the Adit. Based on the site topography (steepness and ruggedness) observed by the Team and conversations with the OSC and the DRMS experts, (See Attachment F, first photo) the use of such a technique would have been very difficult and expensive at the Adit. The unstable and steep slope above the Adit had loose soils and rock and the underlying bedrock was prone to cave-ins, as observed over the nearby Old Adit (See Attachment F, photo 3). Because of the soil and rock conditions, the access and drilling of a hole into the Adit from above would have been quite costly and require much more planning and multiple field seasons to accomplish. Although difficult and therefore expensive and technically challenging, this procedure may have been able to discover the pressurized conditions that turned out to cause the blowout.

- An additional potential clue of potential pressurization was the decrease in flows from the Gold King Adits over the years (Attachment E). That decrease could have been an indication of impounded water from a blockage. The mine drainage flow before 2005 was understood to be zero and increased from 42 gpm in 2005 to 135gpm in September 2005 and peaked at 314 gpm in October 2006. This increase is attributed to rising groundwater in the Gold King Mine workings from plugging of the back portion of the American tunnel in 1995 and possibly 2002. The average flows in 2010 dropped to 206 gpm, further dropped to an average of 140 in 2011 and finally to about 70 gpm or less in the past year. These conditions may indicate some type of internal change to the mine such as additional cave-ins, or a restriction due to already caved material, perhaps by chemical precipitates, or some other cause. It is also possible that the reduced flows could have been attributed to decreased precipitation in the area or increased flows from the American Tunnel.

Less than 13 gpm Sept 11, 2014

- The Team was not able to identify any calculations made on the possible volume of water that could be held behind the portal plug. This calculation could have been useful in determining possible response scenarios for unexpected releases.

- The Request for Proposals (RFP) that included the work at the Adit project requested a plan for dealing with mine water flow and also states that the blockage in the Adit must be removed in a manner to prevent a surge of impounded mine water from being released. It called for the water impounded behind the blockage to be drawn down in a controlled manner as the blockage is removed. Upon review of the work plan, the contractor provided a description and conceptual drawing for dealing with the water (Attachment D). However, the Team believes that Emergency Action Plan (EAP) included with the site plan did not anticipate or plan for the volume or pressure encountered and contained only limited emergency procedures in case of a mine blowout. This lack of information about a blowout in the EAP could indicate the low expectation of its occurrence by the contractor and reviewers. These procedures and contacts may have been included in the Site Health and Safety Plan but this document could not be obtained in time for this report.

Conclusions:

Based on the review of the available information, including the interviews, documents and site visit, the Team is providing the following conclusions:

1. The EPA site removal investigation team had extensive experience with the investigation and closure of mines. The EPA site removal investigation team had consulted with and had the field support of the DRMS. The EPA site removal investigation team also performed outreach to the ARSG, to provide an opportunity for additional input regarding the planned activities. The EPA site removal investigation team and the other entities consulted or who provided information about the proposed activities had extensive site knowledge of the mine workings and extensive experience evaluating and working on mine sites. None of those participating or informed parties raised any significant concerns with the proposed activities.

2. In preparation for the investigation activities, EPA had collected and analyzed flow data, was familiar with site topography, and had inspected the site for signs of seeps, including the area above the Adit, prior to implementing the execution of the work plan.

3. It is not evident that the potential volume of water stored within the Adit had been estimated. Given the maps and information known about this mine, a worst case scenario estimate could have been calculated and used for planning purposes. When adequate information is available, performing such calculations may aid the site management team in instances where water is anticipated to be trapped in an adit. The interconnectivity of

mine workings could be used to estimate potential water volume prior to opening up a collapsed adit.

4. Additional expert opinions may be warranted for sites with collapsed adits, complex interconnectivity of mine workings, and highly transmissive bedrock groundwater systems.

5. The work plan contained an EAP which included provisions for mine emergencies including cave-ins. However, based on the documents reviewed by the Team, it was lacking emergency protocols in the case of a significant flow or blow out. It should be noted that the site team responded appropriately during and after the blowout by moving personnel and equipment and diverting mine water discharge. Such provisions are an important component of an EAP on sites such as the Gold King Mine. There may have been some contingencies planned in case of a blowout, but it could not be ascertained by the Team during the review period.

6. The Adit is located in a remote, rugged mountain location in the Rocky Mountains. The level of effort necessary to mobilize a drill rig and create a drill pad to undertake drilling or other investigative techniques to determine pressure (hydrostatic head) within the mine would require significant resources and add additional time to the implementation schedule and may not be successful in ascertaining water levels or pressure within the mine. Safety is a key consideration for drilling at the Gold King site, and establishing a safe location for the drill pad would be very challenging given the steepness and instability of the slopes above and in proximity to the Adit. Drilling to hit a target such as an adit or tunnel can be very challenging if the drill pad cannot be located in close proximity the adit entrance. It can also be a lengthy process and require considerable effort and expense. However, if it could be performed successfully and safely, drilling could provide the information needed to ascertain the pressure behind the collapsed workings within the mine.

7. In reviewing the pertinent documents provided, interviews conducted, visiting the site and evaluating the photo logs, the Team concludes that the Adit blowout was likely inevitable. Actions taken by the EPA OSC to pull out the site personnel and crew from and near the Adit, just prior to the blowout, probably avoided any fatalities from the pressurized Adit blowout.

8. Although the removal investigation team was quite experienced and followed standard procedures of a well thought out work plan that included state and ARSG involvement, the underestimation of the water pressure in the Gold King Mine workings is believed to be the most significant factor relating to the blowout.

9. A limited review of internet resources did not reveal any existing guidelines or procedures for assessing highly pressurized mine adits or tunnels, such as Gold King Mine.

Recommendations:

1. EPA should develop guidance to outline the steps that should be undertaken to minimize the risk of an adit blowout associated with investigation or cleanup activities. The guidance, at a minimum, should:
   a. Identify a tiered approach that requires increased detail regarding the proposed action based on the complexity of the site conditions or the potential nature of any release.
   b. Provide criteria to identify whether a proposed investigation or cleanup action presents a low, moderate, or high risk with respect to the potential for an adit blowout and significant release of acid mine drainage or mine waste.
   c. Require that a management review meeting(s), including the key state (and other federal agencies when appropriate) be held to determine whether sufficient information exists to meet the criteria established in the guidance or whether additional information is necessary before undertaking the investigation or cleanup activity.
   d. Outline the outreach activities to inform the local community and stakeholders.
   e. Identify the contingency planning that may be appropriate based upon the risk of blowout and the nature of the potential release.

2. Even though the chance of encountering pressurized mine water was investigated in many ways at the Gold King Mine, the Gold King Mine blowout suggests that EPA should develop a toolbox of additional investigative tools such as remote sensing or drilling into the mine pool from the top or side that should be more seriously considered at similar sites. It's important to recognize that underground mines may be extremely complex, making characterization of the internal hydraulic conditions and flow paths challenging. Adding to this complexity is that older mine workings are often not well mapped and that some underground mines may also be structurally unstable and prone to cave-ins and internal plugging making them very difficult to assess. The toolbox should identify techniques which could be used to minimize uncertainties associated with these types of mines. Site specific conditions may make certain investigative tools prohibitive or extremely challenging and costly. In the end, while additional information gathering may reduce the uncertainty, a complete understanding of the underground conditions may not be attainable.

3. Emergency Action Plans should include protocols should a blowout occur at those mine sites where there is a potential for such an event to occur.

4. Information and rationale developed by a site team in anticipation of an investigation or cleanup action for sites where an adit blowout could be a concern (e.g., available pressure information, a reasonable estimate of the volume of water within the mine workings, or adit drainage flow rate data) should be critically reviewed by a qualified and experienced Regional Mining engineer and or Mining Hydrologist/Geologist. The Region may want to consider getting assistance from qualified outside parties such as other federal agencies, state agencies, or outside consultants in conducting this critical review.

5. The Team also recommends that subsequent reviews of the Gold King Mine Adit Blowout by an Independent External Review Group or the Office of Inspector General consider the possibility of assembling a panel of experts consisting of mining industry experts, other federal and state mining experts, academia, consultants, non-governmental organizations and tribal governments to further analyze the situation encountered at this site and come up with recommendations on additional safeguard measures to reduce the risk and minimize the consequences of such incidents in the future.

[redacted]

[redacted]

om: [redacted]
ent: Sunday, August 16, 2015 9:00 PM
To: [redacted]
Cc: [redacted]
Subject: Gold King Mine Incident Chronology

[redacted] I am going to go through the chronology using [redacted] photos...easiest for me and conveys my thinking at the time as well...

In photo 1 taken on the 4th of August we are clearing away the ruble in front of the plug area. There was a lot of unconsolidated material to be cleared away to even approach the plug area.
The visible pipes were put in previously by the state to direct flow from the adit. The adit has historically been flowing from underneath for a number of years from 70 gpm to 200 gpm. Over the years a number of pipes (one in the background right of the excavator) have been shoved into the bottom in attempts to keep the mine draining so that it would not form a mine pool. Because all this was unconsolidated material it was considered safe to remove it was not buttressing the plug. In the background you can see the unconsolidated material (loose dirt) that was overhead and how much of it filled what I call the slot the adit portal is in.

Photo 2 just shows unconsolidated dirt, pipe, culvert with pipe and water flowing from underneath and dirt overhead sluffing in....just removing dirt.

Photo 3 still dirt and water flowing from beneath pile.

oto 4 close up of dirt.

Photo 5 [redacted] (DRMS) taking a close look at where we are in the excavation of the dirt and where anything that might be considered an integral part of the plug might be showing up.
We were constantly and carefully watching for and closely inspecting the digging for indications of the plug. The sluffing dirt is evident in the picture.

Photo 6 is of the gulch below the mine dump.

Photo 7 is of hay bales we put in to catch sedimentation as we excavated.

Photo 8 shows the extent of the dirt filling the slot and gives a good understanding of why it was a puzzle just how far back the hard rock face was up this slope. To even see the plug this material had to be removed.

Photo 9 shows more pipe, water from underneath and sluffing dirt, water is ponded because flow is impeded by the sluffing dirt below down out of the picture. The excavator is working from a pad that is higher than this hole in the bottom of the slot which can be seen in the previous picture.

Photo 10 is of the gulch below the mine.

Photo 11 same.

Photo 12 here we are getting a first glimpse of the plug. The materials are a mix of the dirt sluffing material, water from e flow underneath, and timbers that were on the sides of the slot and not buttressing or holding back anything but the sites. The plug is evident by the lighter material (the caved rock) and the jumble of ruble and timbers from the sides. There were no intact timber sets at this point only what remained of the sides. An older pipe installed sometime in the past to drain the adit can be seen. At this point we were carefully inspecting the face for any sign of damp soil, change

in flow of the underneath water, change in flow of the water from the nearby old adit which was flowing steady and clear. But not getting to close because of the sluffing dirt. We cleaned out the ruble and decided to leave it like this until the next day when the entire technical team (the addition of [redacted] from DRMS) came to advise and determine what to do next if anything.

Photo 13 this is the next day the 5th of August the technical team is gathered on site and evaluating the situation. Here we see the outer face of the plug. It is dry and appears solid and compacted. There has definitely been a cave in. We could not inspect it closely because of dirt sluffing in from overhead. Again no change in flow of the water underneath. The sluffing dirt can be seen over the plug. Evident in this photo is the exposed timber set. The posts and cap with lagging is clearly seen. The timber set is clearly skewed down to the left from failure. What is also evident is the timber blocking on top of the cap and lagging where it was installed to try and catch up to caving and running ground in the hopes of ultimately supporting the back (roof) and stop the run of caving. With this exposed we had some indication of where the back had been and where it might be and how far to safely stay away from it. Keeping in mind that the mine should be assumed to be full of water - that is backed up to the top of the plug or higher - we did not want to get anywhere close to the top of the plug. We estimated a safe distance above the caved timber set that was not to be touched. We agreed this was as far as we were going to go in the approach to the plug. However, we needed to determine where the bedrock (hard rock surface overhead was to plan a safe approach to the plug. The lose dirt can be seen essentially draped on top of and over the plug. So we set about looking for bedrock.

Photo 14 shows the excavator doing that. We built a ramp up about 4 feet for the excavator to work from and reach higher up the face by first filling in the front of the slot with course rock for the underneath water to flow through then dump material on that to support the excavator. We brought down the dirt in carefully determined increments and dragged it forward away from the plug face for the front end loader to pick up and remove. The photo clearly illustrates the excavator doing that, the ramp that was built up for that purpose, and the large amount of dirt hanging above the face some of which was sluffing and some of which required a nudge to bring down. Again there was no change in flow of the water underneath.

Photo 15 illustrates the continuation of this process with pile of material awaiting the loader to pick it up and remove it. The face of the plug is well below these excavations.

Photo 16 shows the face a bit cleaner with the excavator out and a pile of material waiting to be picked up by the front end loader. The ramp for the excavator is clearly shown. At this point we had clearly found the bedrock and there was very little material left hanging above.

Photo 17 is the same shot as the previous only zoomed in because we had spotted a small stream of clear water that at first looked like a spring coming from the rock face below the white spot on the face. I think it is visible in this photo but not positive. At this point I had the loader back out as I think he was about to pick up the load in the foreground and I went in as far as I safely could to see if in fact it was a spring. On as close inspection as I dared I could see that the clear water was spurting up not down. A couple of minutes later red water began to flow out from near that spot. We cleared the area. At first it did not appear as if it would be very much flow but it steadily increased and in a couple of minutes it became obvious there was a lot of water coming. We ensured that we had cleared the area of ourselves and equipment and began to find a way to make the necessary notifications. There is no cell phone service at the site and satellite service is unreliable so no satellite phone was at the local but we did have two way radios that had proven to be reliable so we contacted workers down the mountain working on another site and told them to keep anyone away from the gulch and creek where the flow was headed. Then sent one of them to get the Colorado State DRMS people who had left the site a short time before (that was when we all decided we could see enough of the plug and decided to just look for the bedrock above) to look at anther mine. They got to the State guys who knew the notification system and did all the necessary notifications. I defer to their description and chronology at this point.

Someone did come up to get the RM and myself so that we could go down and ensure all notifications had been made and see what needed to be done.

The rest is our rebuilding the roads to get out, diverting the water from the adit back into the flume (half culvert), and planning the recovery as per the National Contingency Plan (NCP).

is is a long discussion so please extract out the content you need for brevity but it helped me to step through the sequence of events.

(b) (6)

This discussion is subject to attorney/client privileges.

Sent from my iPad

1547102

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region08

Ref: 8EPR-ER

August 17, 2015

MEMORANDUM

SUBJECT: Gold King Mine R(b) (6) [redacted]

FROM: (b) (6) [redacted]
On-Scene Coordi[redacted]

TO: Site File

The following is a partial chronology of events from the Gold King Mine Release incident that occurred on August 5, 2015, and covers approximately the first 48 hours of the incident. I was in the Denver EPA Office serving as phone duty officer. I received the notification from the National Response Center and found two related e-mails on the Region 8 RRC e-mail box (e-mails attached) from CDPHE. All other events noted below were based on conversations with others such as the EPA OSC at the mine site, EPA employees serving in the REOC during the subsequent days of the incident, conference calls with stakeholders such as La Plata County, and written information from EPA's START contractor and an e-mail from personnel at the Colorado Division of Reclamation, Mining and Safety (DRMS).

8/5/2015

- Release occurs (10:51am).
- Safety of on-site personnel is secured.
- The road at the mine site was destroyed and the crew was trapped with no cell phone coverage. The EPA crew radios to an EPA ERRS contractor who was off-site to notify him of the situation. The contractor finds the DRMS team who was off-site. EPA and DRMS communicate via radio (approximately 11:45 a.m.) and the OSC instructs DRMS to make notifications.
- 11:50 a.m. The EPA OSC and the ERRS contractor response manager left the Gold King Mine on foot to get picked up and driven to an area with phone reception to notify authorities. The START contractor stayed at the mine adit area to monitor the mine for additional surges of water and to provide support to the ERRS operator rebuilding the road.
- 12:20 The ERRS contractor began reconstructing the exit road from the site to help demobilize the equipment, vehicles, and personnel.
- CDPHE is notified by DRMS (12:40 pm)

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- CDPHE makes notifications to Durango, San Juan Basin Health Dept., and water intakes, and notifications are complete by 1:39 pm. The EPA Phone Duty Officer also notifies Colorado downstream water intakes (the same ones that CDPHE notified) later in the afternoon. The DRMS e-mail indicated that CDPHE was supposed to ensure agricultural users were also notified.

- DRMS notifies the National Response Center (12:27 pm). The NRC makes notification to the EPA Region 8 phone duty officer. (NRC reports are automatically forwarded to a number of other agencies including CDPHE, Colorado Information Analysis Center, U.S. Department of Interior which includes the U.S. Fish & Wildlife Service, and others).

- The DRMS e-mail states that they coincidentally met the San Juan County Sheriff as the release was flowing down Cement Creek at approximately 12:47 p.m.

- There is an EPA and contractor team in the area for another project and they are familiar with Animas River sampling locations. They are diverted to the incident and begin collecting river water samples. (first round collected at 6pm, second round near midnight, another round the following morning).

- The plume reaches Silverton.

- EPA issues first press release (11:26 pm)

8/6/2015

- EPA Region 8 stands up the REOC (10:00 a.m.).

- EPA Headquarters, Region 6 and Region 9 are notified (11:00).

- The Animas River is closed to recreational users (there was coordination with local agencies and ATSDR to make this decision at approximately 10:30; EPA saw an official printed release later in the afternoon).

- EPA Region 8 Acting Water Program Director confirmed that the State had notified water users the previous day.

- The OSC met with the Town of Silverton at 11:00 a.m. He was also going to meet with La Plata County/Durango at 2:00 p.m.

- EPA Region 8 conference call with the La Plata County Emergency Manager around 11:00 a.m. or so. He reported that major irrigation users had shut their head gates.

- The Durango Treatment Plant is secure per reports from the EPA Water Program (3:45 p.m.).

- Conference call with EPA Region 6 in the afternoon before 2:00 p.m. They reported that their Water Program had contacted New Mexico.

- The plume reaches Durango (late afternoon).
- EPA deploys an additional OSC, two START contractors, the ASPECT plane (Airborne Spectral Photometric Environmental Collection Technology), and Community Involvement Coordinator personnel (varied, beginning at 12:30 pm).
- EPA issued SitRep (approx. 3:30 pm).

8/7/2015

- ASPECT flyover (initiated at 7:30 a.m., found extent of plume at 8:30 a.m.; lat/longs received, map pending).
- Coordination call with R6, R9 and HQ. Region 9 was planning to sample at the Navajo Reservation.
- Preliminary results for sampling and monitoring is expected to be received on this day.
- As of 8:30 a.m. the plume had not yet reached New Mexico.
- OSC in the field reports that private residential wells were showing yellow color and requests ERRS support for alternative water (distribution began that evening).
- EPA requests information from USGS regarding a stream gauge on Cement Creek and USGS reports that the release was larger than 1,000,000 gallons.
- Region 8 receives a call from FEMA R8 because their tribal liaison was getting calls from the Navajo Nation and EPA Region 8 provided Region 9's OSC contact info to FEMA.
- EPA Region 8 holds call with the Region 8 Regional Response Team (including the U.S. Department of Interior from R6 and R8, and multiple Forest Service representatives,)

Attachments

Submit Action Report | Spill Summary Report

NATIONAL RESPONSE CENTER 1-800-424-8802
GOVERNMENT USE ONLYGOVERNMENT USE ONLY***
Information released to a third party shall comply with any
applicable federal and/or state Freedom of Information and Privacy Laws

Incident Report # 1124824

INCIDENT DESCRIPTION

*Report taken by: CIV (b)(6) at 14:27 on 05-AUG-15
Incident Type: FIXED
Incident Cause: OTHER
Affected Area: ANIMAS RIVER
Incident occurred on 05-AUG-15 at 11:30 local incident time.
Affected Medium: WATER ANIMAS RIVER

REPORTING PARTY

Name: (b)(6)
Organization: STATE
Address: 1313 SHERMAN STREET
RM 215

DENVER, CO 80203

PRIMARY Phone: (303)0663567
Type of Organization: STATE GOVERNMENT

SUSPECTED RESPONSIBLE PARTY

Name: UNKNOWN

Type of Organization: UNKNOWN

INCIDENT LOCATION

County: SAN JUAN

City: SILVERTON State: CO
10 MILES NORTH OF THE TOWN OF SILVERTON

RELEASED MATERIAL(S)

CHRIS Code: NCC Official Material Name: NO CHRIS CODE
Also Known As: MINE WATER
Qty Released: 0 UNKNOWN AMOUNT Qty in Water: 0 UNKNOWN AMOUNT

DESCRIPTION OF INCIDENT

CALLER IS REPORTING A RELEASE OF MINE WATER FROM AN UNDER GROUND MINE

INCIDENT DETAILS

Package: N/A
Building ID:
Type of Fixed Object: OTHER
Power Generating Facility: UNKNOWN
Generating Capacity:
Type of Fuel:
NPDES:
SPCC Compliant: UNKNOWN
---SHEEN INFORMATION---
Sheen Color:
Sheen Odor Description: MINE WATER
Sheen Travel Direction:
Sheen Size Length:
Sheen Size Width:
---WATER INFORMATION---
Body of Water: ANIMAS RIVER

Tributary of:
Nearest River Mile Marker:
Water Supply Contaminated: UNKNOWN

IMPACT

Fire Involved: NO Fire Extinguished: UNKNOWN

INJURIES:	NO	Hospitalized:	Empl/Crew:	Passenger:	
FATALITIES:	NO	Empl/Crew:	Passenger:	Occupant:	
EVACUATIONS:	NO	Who Evacuated:	Radius/Area:		
Damages:	NO				

Closure Type	Description of Closure	Hours Closed	Direction of Closure
Air: N			
Road: N			
Waterway: N			
Track: N			

Major Artery: N

Passengers Transferred: NO
Environmental Impact: NO
Media Interest: UNKNOWN Community Impact due to Material:

REMEDIAL ACTIONS

CALLER ALSO STATED THAT ANYONE THAT IS USING THE WATER FOR IRRIGATION PURPOSES SHOULD NOT USE THE WATER, PERSONNEL ARE ONSITE AT THE MINE, THE COUNTY AND LOCAL POLICE HAVE BEEN MOBILIZED
Release Secured: UNKNOWN
Release Rate:
Estimated Release Duration:

WEATHER

ADDITIONAL AGENCIES NOTIFIED

Federal:
State/Local: STATE, LOCAL POLICE, COUNTY
State/Local On Scene: STATE, LOCAL POLICE, COUNTY
State Agency Number:

NOTIFICATIONS BY NRC

CENTERS FOR DISEASE CONTROL (GRASP)
05-AUG-15 14:37 (770)4887100
DHS NOC (NOC)
05-AUG-15 14:37 (202)2820114
CGIS RAO ST. LOUIS (COMMAND CENTER)
05-AUG-15 14:37 (314)2692420
CO DEPT OF HEALTH AND ENVIRONMENT (MAIN OFFICE)
05-AUG-15 14:37 (877)5185608
COLORADO INFO ANALYSIS CENTER (FUSION CENTER)
05-AUG-15 14:37 (720)8526705
DOT CRISIS MANAGEMENT CENTER (MAIN OFFICE)
05-AUG-15 14:37 (202)3661863
U.S. EPA VIII (MAIN OFFICE)
05-AUG-15 14:39 (303)2931788 ACKERMAN
NATIONAL INFRASTRUCTURE COORD CTR (MAIN OFFICE)
05-AUG-15 14:37 (202)2829201
NOAA RPTS FOR CO (MAIN OFFICE)
05-AUG-15 14:37 (206)5264911
NATIONAL RESPONSE CENTER HQ (AUTOMATIC REPORTS)
05-AUG-15 14:37 (202)2671136
CO OIL & GAS CONSERVATION COMM (MAIN OFFICE)
05-AUG-15 14:37 (303)8942100
DOI/OEPC DENVER (MAIN OFFICE)

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   05-AUG-15    14:37    (303)4452500
USCG DISTRICT 8 (MAIN OFFICE)
   05-AUG-15    14:37    (504)5896225
```

ADDITIONAL INFORMATION

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*** END INCIDENT REPORT #      1124824   ***
Report any problems by calling 1-800-424-8802
PLEASE VISIT OUR WEB SITE AT http://www.nrc.uscg.mil
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Close Window

SLIDE SUBMITTED BY RANKING MEMBER EDDIE BERNICE JOHNSON

EPA United States Environmental Protection Agency

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Gold King Mine Videos

Emergency Response to August 2015 Release from Gold King Mine

To continue to provide as much information as possible to the public and maintain the greatest degree of transparency, EPA became aware of videos taken by EPA contractors who were on-site during the Gold King Mine release and the agency is releasing them to the public. For easier viewing, some of the videos have been rotated so they are no longer upside down. In addition, EPA removed profanity contained in the audio of the videos and obscured visible license plates for privacy purposes. EPA did not edit the videos in any other way.

In addition, EPA removed profanity contained in the audio of the videos and obscured visible license plates for privacy purposes. EPA did not edit the videos in any other way.

In addition, today (September 2, 2015) EPA released an update on water quality and sediment data for the Animas and San Juan Rivers. EPA announced metal concentrations of the samples are below sediment/soil and surface water recreational screening levels, and are being maintained at pre-event conditions. EPA has reviewed data which include comparison to screening levels for exposure during recreational use. Based on previous monitoring events, it has been shown that metal concentrations may fluctuate from time to time because of water surges due to heavy rains or other events that may change the water flow rates or volume.

Gold King Mine Video 1

Gold King Mine Video 2

Gold King Mine Video 3

Gold King Mine Video 4

Gold King Mine Video 5

Gold King Mine Video 6

Gold King Mine Video 7

Gold King Mine Video 8

Gold King Mine Video 9

1